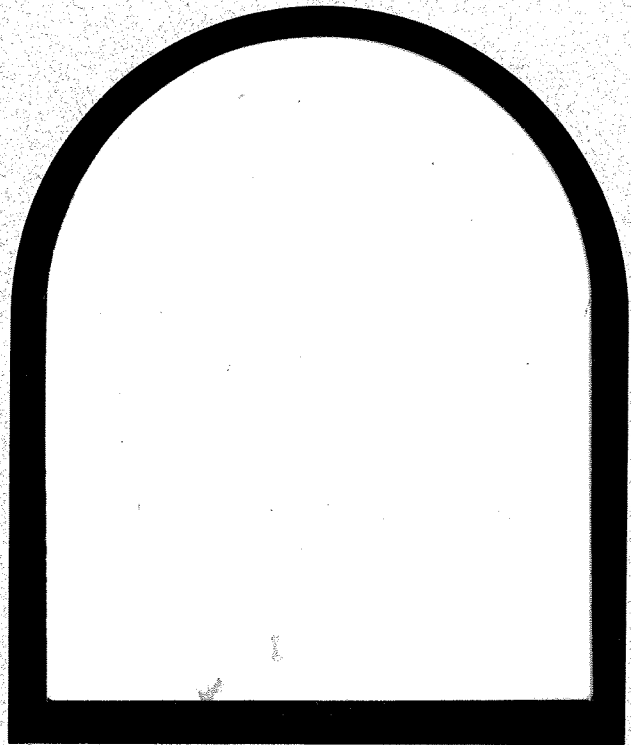


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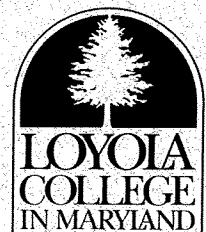


*David D. Lattanze Center  
for Executive Studies in Information Systems*

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*Working Paper Series*

*Joseph A. Sellinger, S.J.  
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**Information Systems Management  
in a Distributed World:  
Changes in Power,  
Leadership and Teams**

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**WP1291.012**

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December, 1991

This paper was supported by a grant from the *Lattanze Center for Executive Studies in Management Information Systems*. Our special thanks to those people who contributed generously of their time and insight: Tom Durel (Blue Cross & Blue Shield), Ann Hunt (IBM), Ed Kraus (Manor Care), Tom Lonegro (USF&G), Bob McMahon (Westinghouse), and Jack Thompson (McCormick)

Information Systems Management in a Distributed World:  
Changes in Power, Leadership, and Teams

A key dimension of IS services has to do with the distribution of those services. In general, the trend has been to move away from highly centralized systems toward those in which IS services are distributed across the strategic business units of the organization. In this paper we briefly examine the nature of distributed IS processes. Next, we examine management practices that will be important in such an environment. We conclude that, in moving from centralized to distributed systems, the IS manager must shift from a strategy of control utilizing formal hierarchy and authority to one of building the commitment of those outside of their direct control to accomplish the mission of IS. First, power relationships will change, as the IS function is exercised more through lateral relationships spanning the organization than through vertical power relationships. Secondly, instead of a command driven leadership where clarity of purpose and drive is key, leadership which builds leadership in others will become increasingly important. Finally, instead of work teams comprised of similarly skilled individuals focused on a particular project and under the control of the IS manager, the IS manager must become adept at managing cross functional teams and semi-autonomous teams whose authority is granted from outside the IS function.

Information Systems Management in a Distributed World:  
Changes in Power, Leadership, and Teams

Major organizational changes are happening more and more frequently, and they have become a matter of survival (Jick, 1990). Industries will look much different in the 80's and 90's and so also will functional divisions such as Information Systems (IS). IS functions must deal not only with technological transitions due to advances in information related technologies, but new management practices, which involves the revision of principles, assumptions, and systems (Kanter, 1987). A key dimension of IS services has to do with the distribution of those services. In general, the trend has been to move away from highly centralized systems toward those in which IS services are distributed across the strategic business units of the organization. In this paper we briefly examine the nature of distributed IS processes. Next, we examine management practices that will be important in such an environment. Our contention is that managing an IS shop in a distributed environment requires a dramatically different approach to management than one which may be appropriate to the hierarchical systems more prevalent in organizations in which IS services are highly centralized.

Distributed Information Systems

Historically, the relative balance between distributed and centralized information processing has depended partly on: 1) the goals of those needing information, and 2) the technology available to implement the goals. Prior to computerized information processing, manual distributed processing was necessary due to technical barriers to centralized collecting. With the information technologies of the 50's and 60's, the balance shifted toward centralized processing. Peters (1987) describes the old IS as consisting of centralized control of information in which the central IS fiefdom functions as information hoarders for the sake of consistency. However, assuring this consistency also made it difficult to respond to the increasingly dynamic business environment. The hierarchical command and control structure associated with such centralized systems made it difficult to deal with huge volumes of complex information, while

centralized rules, authority, and power made it difficult to take innovative action (Beer, Eisenstat, and Spector, 1990). The problem of integration was further complicated by the division of labor and increased functional specialization within the centralized IS structure.

With current technologies it makes sense economically to distribute data collection, storage, and processing toward end users. This shift supports the trend by users for autonomy, creativity, and decision making power. In a partial response, there has arisen distributed systems. A working definition of a distributed information system might be one in which authority over one or more information system activities has been distributed, i. e., delegated. A key point here is that data processing is an organizational resource involving many activities which may be centralized or decentralized. For our purposes, a completely centralized activity is one that is wholly undertaken by central information systems, whereas a completely decentralized system is one in which all activities are under the control of the user unit. A distributed activity represents a mix of these two approaches.

There exists a wide variety of distributed systems, which vary along two dimensions: 1) how many activities are distributed; and 2) what is the degree of distribution of each distributed activity. Emery (1977) has suggested that the principle alternative structures of distributed processing may be arrayed on a continuum. At one end is *distributed processing with a central data base*. Under this system some processing takes place at local minicomputers (data entry and validation) but without the support of a local data base. Next is a *hierarchical system with local data bases*. This configuration describes a situation in which processing is done locally and the local data base is updated from local transactions and also, periodically, from the central data base. Summary data is sent to the central computer for global processing and central data base updating. A third type is a *distributed data base with limited sharing*. In addition to having local processing and a local data base, the local center can access other local data bases for low probability events (like verifying the balance for a bank customer wishing to cash a check at a branch other than their own). A fourth category is a *multiple level hierarchical distributed system*. Here any local processor of a distributed system is a central node of a lower - level

distributed system. At the other end of the continuum is the *fully distributed network*. This type is composed of multiple autonomous processes and partitioned data bases that have equal control status, i. e., a non-hierarchical structure without central control and with no single computer playing a central role. This arrangement permits resource sharing (primarily programs and data) among network sites by telecommunications.

A key feature of distributed systems is that they involve the coordination of IS functions and services both within and outside of the IS hierarchy. Thus, much of authority that IS managers previously had by virtue of the IS hierarchy is no longer available to them. However, some control and coordination is still necessary even among services which are undertaken outside of the IS hierarchy in order to maintain economies of scale, utilization of expertise, and to allow transfer of data. In short, as IS services are distributed out to the strategic business units of the organization, the IS manager must shift from a *control* strategy to a *commitment* strategy. In place of formal hierarchical control and authority, IS managers must now rely on the commitment and dedication of those outside of their direct control to accomplish the mission of IS.

#### Implications of a Commitment Strategy in IS

The transition from a strategy of control to one of commitment involves changes in both the design of work and how authority is distributed and exercised (Walton & Hackman, 1986). First, power relationships will change, as members become more empowered and the IS function is exercised more through lateral relationships spanning the organization than through the hierarchical, vertical power relationships. Secondly, the role of leadership must change. Instead of a command driven leadership where clarity of purpose and drive were paramount, leadership which builds leadership in others will become increasingly important. Finally, the nature of work teams will also change. Instead of work teams comprised of similarly skilled individuals focused on a particular project and under the control of the IS manager, the IS manager must become adept at managing cross functional teams and semi-autonomous teams whose authority

is granted from outside the IS function. In the following sections we examine some of these approaches of management.

### *Power*

In centralized IS systems, it was possible to consider power from the context of the organizational hierarchy (e.g., in terms of vertical power). Thus, an IS manager's capacity to influence others could be considered in terms of their reward, coercive, legitimate, expert, and referent power (Cf., French & Raven, 1959; Podsakoff & Schriesheim, 1985). These power bases presume the existence of a chain of command through which to exercise power. For distributed IS systems, however, many responsibilities of the IS manager lie outside the chain of command. Further, the organizational hierarchy does not provide enough resources for IS managers to exist separately -- they need resources that are now outside of the IS function. When IS resources no longer exist under a single functional unit it is critical to consider lateral power relationships, for it is frequently peers and members over whom the IS manager has no formal authority that the IS manager must influence in order to accomplish the IS mission.

Recently, several authors have sought to examine lateral power relationships as distinct from their vertical counterparts (Cohen & Bradford, 1990; Kaplan, 1984). These authors argue that power can be cultivated by looking at other managers as potential allies engaged in the ongoing exchange of resources. Such an approach differs considerably from hierarchical power, in that it requires an understanding of 1) what managers outside of IS can contribute to IS objectives, 2) the kinds of pressures and concerns that the SBU faces, and 3) what IS can contribute to helping the SBU achieve its objectives. In essence, building reciprocal power involves determining the kinds of resources or services that each party can bring to the table and to make those exchanges.

Effectively exercising lateral power requires a number of skills on the part of IS managers which may have not been necessary to the same extent in a hierarchical system. First, it requires that IS professionals become much more knowledgeable with respect to the strategic

and operating aspects of the business or businesses that they support (Gerstein, 1987).

Secondly, it becomes clear that achieving IS goals in a distributed system relies heavily on work conducted in the SBUs. IS managers will have to think through and become comfortable with these dependency relationships. Finally, effective utilization of lateral power requires more fluidity and dexterity in managing relationships and networks of relationships over a longer term. Commitment is built only through long term relationships involving significant trust. IS managers will need to become more comfortable taking an increasingly long view of their relationships and of the success of their allies.

### *Leadership*

Moving from a control to a commitment strategy as required by a distributed information system also requires a different approach to leadership. In centralized IS systems where extensive control is present, clarity of purpose and organization is critical for exerting effective leadership. For distributed systems, however, the direction and objectives of IS depends in many ways on the needs, opportunities, and capabilities of the strategic business units. Thus, instead of personal leadership, the IS manager must cultivate information leadership in others.

Recently, Manz and Sims (1989) have argued that managers can instill in others the capacity to lead themselves when they encourage others to clarify information system objectives, build the components of successful implementation, and work with them to evaluate their performance in achieving these objectives. The process begins with *self-observation*, in which the IS manager encourages others to discover what needs to change and how to go about making these changes. Next, the IS manager should encourage *self-goal setting*, the process of setting specific yet challenging goals for both immediate and longer-term achievements. Once the changes have been identified and goals set, the focus shifts to developing the desired performance. In *rehearsal*, the IS manager helps provide feedback prior to the actual change and increase the confidence of the SBU manager in their ability to execute the desired change. Similarly, developing positive *self-expectations* refers to the IS manager's cultivating an attitude

in which success is anticipated. In the last stage, the IS manager seeks to reinforce the self-leadership of others for future events. In *self-reinforcement*, the IS manager seeks to recognize successful changes taken on the part of others. Similarly, in *self-criticism*, the IS manager seeks to work with the SBU manager to examine an unsuccessful change and determine the causes for failure.

Clearly this is a different approach from the command and control strategy which can be employed in centralized IS functions, assuming that leadership must be vested externally if it is to be effective. In essence, what IS managers are doing is developing leadership in others by stepping them through the process and encouraging ownership of that process. Ownership means that others are encouraged to take a leadership role in the use of information technology and remedy problems which they consider important to the performance of their work. In order to develop this leadership in others, IS managers will not only need to understand the overall system but the implications of local issues (Gerstein, 1987). More importantly, however, IS managers will have to become much more comfortable in a coaching and support role, developing the skills of others to identify the resources they need and to take actions that they feel is necessary based on their understanding of their strategic business unit.

### *Work Teams*

IS managers have long had to be skilled in working with teams; teams are frequently a central feature of IS shops. However, in moving from centralized to distributed systems, the quality of the team is likely to change and the way in which the IS manager interfaces with these teams must change as well. Instead of teams comprised of programmers working within a relatively narrow field, the teams of the distributed world are increasingly cross functional. Further, many if not most of these teams will exist outside of the hierarchical line of responsibility of the IS manager in the distributed IS shop. From the standpoint of the IS manager, these teams are autonomous, that is, he or she must work with these teams as a functioning entity outside of his or her direct control. Increasingly these teams will be formed

around customer problems or services and so will combine members from multiple functions.

Working effectively with autonomous work teams requires new skills on the part of the IS manager: team building, people development, performance management, and boundary management (Letize & Donovan, 1990; Manz & Angle, 1986; Manz & Sims, 1986). In *team building*, the effectiveness of work teams is achieved through improving problem solving and interpersonal skills (Buller & Bell, 1986). For example, Dyer (1987) proposes a problem solving model of team development in which the team identifies key issues which are keeping the team from realizing its potential and works out a discrete plan of action for alleviating these situational constraints. Other authors (Cf., Ancona, 1990; Mitchell, 1986) propose approaches based more on facilitating openness and interaction as a means of improving team effectiveness. IS managers will have to become comfortable with both of these approaches in order to build high commitment teams. By *people development*, we are referring to empowering team members to make changes. Empowerment requires both changing roles and building the skills to perform these new roles (Conger, 1990). Changing roles involves increasing the personal influence of members, getting members to feel comfortable (constructively) questioning the instructions of their supervisors, and conveying to members a sense of control over their own destiny. Skill development involves building expectations that performance will be rewarded, development of problem solving skills, and increasing the scope of concern beyond one's own area of the workplace.

In *performance management*, the IS manager has to be concerned with facilitating team-based rewards (Hackman & Walton, 1986). A high degree of collaborative behavior is now required which entails sharing information with coworkers, taking responsibility for individual mistakes, honoring and using the capabilities of others, and avoiding win/lose conflicts. (Dumaine, 1990). In *boundary management*, the IS manager is concerned with monitoring the flow of information, goods, and services across the team boundary. This requires understanding how the team interacts with the management structure as well as how it interacts with other teams (Manz & Angle, 1986; Manz & Sims, 1986).

Effectively leading teams which are, from the standpoint of the IS hierarchy, autonomous clearly requires a number of skills which may not have been as important when those teams operated within the context of the IS function. Instead of skills relating to controlling interaction and handling information, new skills are required: opening up interaction among team members, helping the team identify and remove barriers to team performance, empowering team members to assume new roles and acquire necessary skills, and helping teams to manage their interaction with management and other teams.

#### Summary

A key feature of distributed systems is the fact that they involve the coordination of IS functions and services both within and outside of the IS hierarchy. As IS services become distributed, the IS manager must shift from a strategy of control utilizing formal hierarchy and authority to one of building the commitment of those outside of their direct control to accomplish the mission of IS. First, power relationships will change, as the IS function is exercised more through lateral relationships spanning the organization than through vertical power relationships. Secondly, instead of a command driven leadership where clarity of purpose and drive is paramount, leadership which builds leadership in others will become increasingly important. Finally, instead of work teams comprised of similarly skilled individuals focused on a particular project and under the control of the IS manager, the IS manager must become adept at managing cross functional teams and semi-autonomous teams whose authority is granted from outside the IS function.

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