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CHANGING ROLES IN IS: A ROLE THEORY PERSPECTIVE

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ABSTRACT

The recent dramatic and interesting advances in computer technology have significantly altered the roles of both users and developers. Role theory might be applied to more fully understand and more effectively investigate organizational, behavioral, and social issues related to these changes. A framework for categorizing information systems roles is built from a matrix of information system and organizational activities. The information system activity dimension is composed of indirect user, direct user, autonomous developer, traditional developer, and facilitator categories. The organizational activity dimension contains clerical, professional, and managerial categories. The resulting matrix can facilitate descriptive research, model building, and hypothesis testing.

1. INTRODUCTION

One of the most dramatic impacts of information techno- logy has been how it has altered previously-existing tasks and contributed entirely new tasks performed by people. Previously-existing tasks have been changed in many cases by automation of repetitive operations, creating new op- portunities for job enlargement. More importantly, how- ever, entirely new tasks have been added in many diverse areas. Examples of such tasks include data retrieval and analysis for decision-making, development and maintenance of such models and applications, and coordination and planning for these uses of technology.

Both the changed and new tasks must be assigned to peo- ple, causing a corresponding need for retraining existing employees and for hiring new ones. The assignment of duties is not so apparent, however, since some of the new tasks are performed by existing employees. In 1972, John Dearden wrote "I believe it is much more practical to teach the new information technology to the functional experts than to teach information technologists functional specialties" (p. 115). At that time, however, Dearden's was a lonely voice, and the trend was well under way to centralize information expertise in organizations.   In Whisler's classic study on the impact of computers on organizations he suggested that

> It may be wise to isolate and specialize thinking
> and research on the optimal use of information
> technology -- to maintain a "think tank" in which
> the most effective solutions to computer exploi-
> tation are sought as objectively as possible.
> [Whisler 1970, p. 42]

IS departments became separated from the financial and accounting groups which had spawned them, began to report directly to the CEO, and in the process gained

power. In the 1970s, information technology was so little understood in the functional areas of organizations that there seemed no alternative to this structural arrangement. By 1977, however, observers were beginning to notice that this implicit ownership of the information system by IS departments created organizational and behavioral problems that often inhibited the success of information system development. Bostrom and Heinen (1977) argued that "An MIS change effort can be successful only if the client assumes the responsibility for its success" (p. 23).

Today, with the proliferation of microcomputers and easy- to-use modeling and programming languages, the fulfill- ment of Dearden's prophesy seems more reasonable. The number of information systems developed by end-users is growing at an accelerating rate. An oft-cited projection suggests that user-developed applications will consume 75 percent to 90 percent of the total computing capacity in American business by 1990 (Benjamin 1982). The demand for information center services is growing at a dramatic rate (AMA 1987), and sophisticated users are more and more frequently developing applications with little assis- tance from MIS departments or information centers. They are becoming system developers who are virtually self- sufficient. The majority of end-user developers surveyed in a recent study (Sumner and Klepper 1987) report that they are wholly responsible for all phases of systems deve- lopment including design, construction and on-going main- tenance.

The phenomenon of end-user computing (EUC) has re- ceived much recent attention in the MIS literature, espe- cially in the area of end-user development (EUD). Des- criptive studies have presented taxonomies of application types and user types found in the EUD movement (Sumner and Klepper 1987; Rivard and Huff 1985; Ben- son 1983; Rockart and Flannery 1983; McLean 1979). These studies and others offer prescriptive advice on

overcoming problems associated with EUD (lack of documentation, data integrity, audit trails, back up, data security, etc.). In addition, they suggest ways to integrate the development activities of end users into the information requirement specification process conducted by IS departments (Ball 1987; Kozar and Mahlum 1987; Pliskin and Shoval 1987; Kraushaar and Shirland 1985; Batiste and Jung 1984).

Most of these studies at least comment on the obvious fact that the EUD phenomenon involves significant changes to the information system roles played by individuals. There has, however, been little attempt to assess the ways in which these role changes affect the individuals or organizations in which they occur. As "users" become "programmers," "analysts," and "designers," what will be the effect on the relationships between user and IS departments? How will relationships between individuals in these departments change? What will happen to the formal organizational structures and to informal coalitions? Will jobs be designed differently, and how will individuals' self perceptions and perceived self-efficacy change?

This paper proposes an analytical framework for evaluating the organizational effects of changing information system roles. It uses as a reference discipline the organizational role theory developed by sociologists and social psychologists. It applies the fundamental concepts of that theory -- *position, role, role-set, role-bargain, role conflict* and *role ambiguity* -- to the phenomena surrounding the development and use of information systems.

Organizational role theory offers a focus and theoretical grounding so often called for in self-examination of the IS discipline. It is relevant to the investigation of a number of organizational, behavioral and social issues important to the IS researcher and can be the basis of a continuing research program which contributes to the building of a cumulative tradition. The IS practitioner will find that role theory can offer guidelines for more effective management of the human resources involved in construction and use of information systems. Practitioners and researchers alike may find that application of this theory offers insight into troublesome questions about the appropriate structure and role of IS departments within organizations.

The remainder of this paper contains major sections concerning the fundamental principles of role theory, an identification of information systems roles, and a program of research into information systems role effects. These are followed by a summary and conclusions section.

2. FUNDAMENTAL PRINCIPLES OF ROLE THEORY

Pfeffer (1985) has categorized various theoretical perspectives in organization theory in terms of the level of analysis at which activity occurs and the theory's perspective on action. As Table 1 shows, role theory analysis occurs at the individual, coalition, or sub-unit level as opposed to the total organizational level. Role theory assumes that the actions of individuals are significantly constrained or determined by the external environment.

Table 1. Categorization of Theoretical Perspectives in Organizational Theory (from Pfeffer 1985)

LEVEL OF ANALYSIS AT WHICH ACTIVITY OCCURS	PERSPECTIVES ON ACTION		
	PURPOSIVE, INTENTIONAL, GOAL-DIRECTED	EXTERNALLY CONSTRAINED, DETERMINED	RANDOM, EMERGENT, RETROSPECTIVELY RATIONAL
Individuals, coalitions, or sub-units	o Needs theories and job design o Goal setting o Expectancy theory o Path-goal leadership theory o Political theories	o Operant conditioning o Role theories o Social influence and social information processing	o Cognitive theories of organizations o Institutionalization theory o Language in organizations o Ethnomethodology o Symbolic interactionism
Total organization	o Structural contingency theory o Markets and hierarchies o Marxist perspectives	o Resource dependence o Population ecology	o Decision process theories (eg., garbage can model)

The theoretical foundations of role theory can be found in the work of Linton (1936, 1939), Merton (1957), and Parsons (1951). A major metaphor is the theatre. Social interaction is visualized as actors playing assigned parts in a script written by a culture in the course of adaptation to environmental circumstance (Stryker and Statham 1985). At Pfeffer's levels of analysis shown above, the nature of organizations (and other social structures) is such that they can be understood in terms of the interactions and functional interdependencies between individuals and groups.

A central notion in organizational role theory is that people tend to enter interactions with pre-existing expectations about how others categorized in certain ways are likely to behave. Over time these expectations become widely shared, stabilize into predictable patterns, and evolve into a collective structure of behavior. People learn through socialization to hold such expectations of themselves and others as a result of the social positions they hold. These stabile, shared patterns of expected behavior which are associated with positions become the basic fabric of organizational roles.

Role theory asserts that the configuration of roles and positions in an organization is an important determinant of individual behavior, attitudes and performance. These effects on individuals in turn have an impact on the organization as a whole. Lieberman's (1956) study of plant workers provides a vivid demonstration of role effects. Initial attitudes of a group of workers were measured. Some workers were then promoted to foremen, others were made shop stewards, while others remained plant workers. There was no difference in attitudes toward the company, job, and union prior to the promotions. Subsequent measurements showed that after promotion, foremen developed more pro-company attitudes. Shop stewards developed stronger pro-union attitudes. Attitudes of workers not promoted remained unchanged. When some of the foremen were demoted back to plant workers as a result of company financial problems, new measurements showed that they assumed their original attitudes. Other studies have also empirically demonstrated the effects of role configuration on conflict (Miles 1977; Rizzo, House, and Litzman 1970) and supervisory behavior (Pfeffer and Salancik 1975).

The best documented role effects involve the relationships between role conflict, role ambiguity and dependent variables such as job dissatisfaction, job-related tension, anxiety, productivity and turnover (see Van Sell, Brief, and Schuler [1981] for a review of this literature). Before turning to further discussion of these variables, however, it is necessary to define four terms commonly used in role theory which are crucial to its understanding.

- A *position* denotes a location in the organizational space of a social structure which is associated with designated rights and obligations. The terms *status* and *office* are commonly used as synonyms for position.

- A *role* is a part of a position consisting of essential recurring actions. The concept of role is an abstraction of the expected, patterned behavior of those in positions. Role refers to what social actors are expected to *do* as opposed to what they are or how they are labeled.

- *Role-bargain* refers to the transactional nature of role behavior. For each role there exists a paired, reciprocal role in a different position. Interaction between these paired roles is thought of in quasi-economic terms, with each role occupant attempting to maximize his rights and minimize his obligations, or establish the most favorable role "price" possible (Goode 1960).

- *Role-set* (Merton 1957) denotes the complement of role relationships in which an individual is involved by virtue of occupying a particular organizational position. This concept recognizes the fact that positions are composed of arrays of roles, each of which is linked to its reciprocal role which is found in a different position.

Bates (1956) elaborated on this idea when he pointed out that groups are composed of parts of persons. That is, any individual is likely to occupy a number of positions in a number of groups. Bates postulated

> Each culture contains a limited fund of roles from which the social structure is built. This limited store of roles is drawn upon to form positions, the building blocks of social structure. Since a limited number of roles exists, it is reasonable to expect that some of them would be found more than once in the social positions which compose a given social structure. An example would be the case of the disciplinarian role which might be found in the position of father as well as in the position of military leader, foremen in a factory, etc. The same would apply to the role of teacher which might be associated with a number of positions. [Bates 1956, p. 315.]

Figure 1 shows a graphical representation adapted from Bates (1956), using the family (in the style of the mid-1950s) as an example of how roles are combined to form positions and how each role is linked to its reciprocal role in another position. Figure 1a illustrates a global view and Figure 1b depicts a more detailed view.
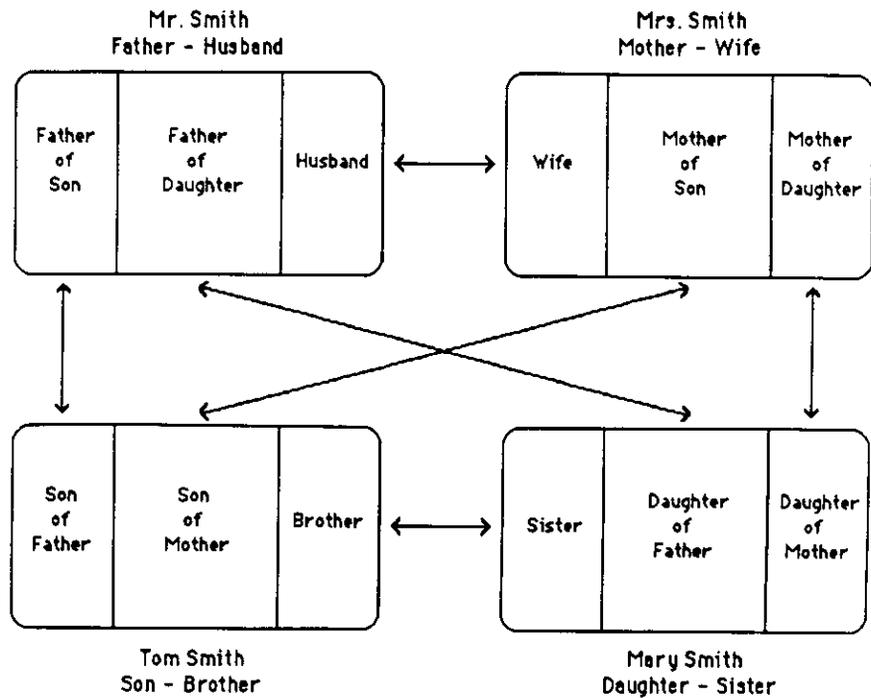
Figure 1a. Global View
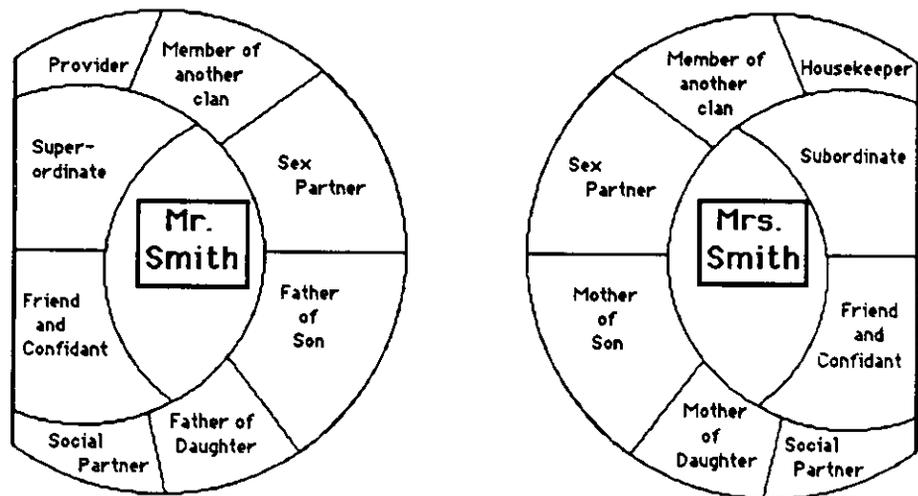

Figure 1b. Detailed View

Figure 1. Roles and Reciprocal Roles (Adapted from Bates 1956)

2.1 Role Conflict and Role Ambiguity

The two constructs most commonly studied by role theorists are *role conflict* and *role ambiguity*.

Role conflict occurs when an individual is required, by virtue of a position he occupies, to play a role which conflicts with his value system or to play two roles which conflict with each other (Van Sell, Brief, and Schuler 1981). Several authors have described the ways in which conflict is generated between roles and positions in a social structure (Katz and Kahn 1967; Kahn et al. 1964; Goode 1960). A fundamental premise of role theory is that social differentiation generates distinct and different

interests. Since the role-set is comprised of a number of people holding different positions, there is always a potential for differing and conflicting expectations among those in the role-set. Since an individual typically takes part in many different role relationships, he is thus likely to face a wide, distracting, and sometimes conflicting array of role obligations. Role conflict or role strain -- the difficulty in meeting a given role's demands -- is, therefore, normal. Role conflict analysis is normally conducted from the perspective of a *focal role*. The individual occupying the focal role is described as the *receiver* of expectations and demands from *senders* in his role-set. Kahn et al (1964) have identified the following forms of role conflict:

1. *Intersender conflict*: The demands of one member of the person's role set conflict or are incompatible with the demands of another person in the set.

2. *Intrasender conflict*: Demands from a single member of the role set are mutually contradictory.

3. *Interrole conflict*: The demands of one role occupied by an individual, such as employee, conflict with the demands of another role, such as family member.

4. *Person-role conflict*: The expectations associated with fulfilling a role conflict with the individual's moral or ethical beliefs or self concept.

5. *Role overload*: Demands of the role are not contradictory per se, but are so extensive and time consuming that the individual cannot cope with all the role expectations.

In summary, these forms of conflict arise in a differentiated social structure as individuals occupying positions represent their interests by trying to improve their role bargains. They attempt to find ways to reduce the expectations of those in their role-set, while at the same time increasing the demands on their role partners.

Role ambiguity has not been as thoroughly conceptualized as role conflict in the literature. Generally, role ambiguity exists when clear information is lacking regarding a) the expectations associated with the role, b) methods for fulfilling known role expectations, and/or c) the consequences of role performance (Van Sell, Brief, and Schuler 1981). Kahn et al. (1964) note that both role conflict and role ambiguity can be thought of in terms of inadequate role sending. In the case of role conflict, lack of agreement or coordination among role senders produces a pattern of sent expectations which are incompatible or overwhelming to the focal person. In the case of role ambiguity, the pattern of sent expectations does not contain sufficient information. Thus, as Van Sell, Brief, and Schuler (1981) point out, even though role conflict and role ambiguity are conceptually distinguishable, one should not expect their empirical indices to be necessarily unrelated.

2.2 Factors Affecting the Level of Role Conflict and Role Ambiguity

Because the norms and values associated with a group's role structure are diversified, interconnected in complex ways, and largely internalized through the process of socialization, individuals rarely have the ability to significantly alter their role bargain (Goode 1960). Miles (1977) and Linton (1939) have described a number of ways in which the configuration of the role-set affects the role conflict perceived by a focal individual. Five of these factors having relevance to the changing information system role structure are described below:

1. *Relative authority*: The relative authority of those in the role-set is related to the perceived level of role conflict experienced by a focal individual. Miles has shown that a role-set composed of those with greater relative authority than the focal individual will result in a higher level of perceived role conflict.

2. *Organizational distance*: Organizational distance is operationally defined by Miles as the number of formal organizational boundaries between the focal individual and a role partner with whom he must interact. The greater the organizational distance of those in the role-set, the higher the perceived role conflict will be for the focal individual.

3. *Functional dependence*: The greater the functional dependence of the focal individual upon those in his role-set, the higher is his perceived role conflict. Conversely, high functional dependence upon the focal individual will result in reduced role conflict.

4. *Observability of the focal role*: Linton has suggested that the more visible the focal role to those in the role-set, the higher the perceived role conflict will be. If it is easy for those in the role-set to observe, understand, and evaluate the performance of the focal role incumbent, his bargaining position is weakened and the expectations of those in the role-set will be more stringent.

5. *Observability of conflicting demands*: To the extent that conflicting demands of those in the role-set are visible to each other, perceived role conflict by the focal individual will tend to be reduced. This occurs because high visibility makes conflict resolution more likely to be the responsibility of those in the role-set. If conflicts between sent demands are invisible to members of the role-set, the problem of resolving the conflicts falls to the focal individual and his perceived conflict is likely to be higher.

2.3 Summary

This brief sketch of the fundamental principles of role theory suggests that these ideas may help us better understand the organizational effects of changing information systems roles. The fact that users are assuming the roles of programmers and system developers is entirely consistent with two of these fundamental principles:

1. Roles can be combined in different ways to form different positions.

2. Positions can be variously located in organizational space.

In the next section, a framework for categorizing information system roles is presented in order to provide a foun-

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dation for analysis of factors affecting role conflict in the information systems context.

3. INFORMATION SYSTEM ROLES

In order to apply role theory to the changing IS environment, it is necessary to further specify generic information system roles. If, as Bates asserts, there are a limited number of generic roles which can be combined in different ways to form positions, how should we define those roles in the IS organizational subsystem? While role theory may be applied to any area of information systems, the particular focus of the remainder of this paper will be on the application of role theory to end-user development. This particular illustration is used because the EUC/EUD movement calls into question the traditional roles of the information systems "specialist" and "user." The application of role theory is particularly visible, dramatic, and interesting in this area.

Several authors have provided categorization schemes for end-user developers. McLean (1979) divides end-user developers into three categories based on background and training:

1. DP professional
2. DP amateur
3. Non-DP-trained users

Rockart and Flannery's (1983) well-known categories appear to be based on two dimensions: The degree of technical skill possessed by the user developer and whether or not the user develops applications for him/herself or for others. Rockart and Flannery's categories are:

1. Non-programming end users
2. Command level programmers
3. End-user programmers
4. Functional support personnel
5. EUC support personnel
6. DP programmers

Rivard and Huff (1985) proposed a three-level categorization:

1. Micro-DP department users
2. Staff analysts
3. Opportunity seekers

This scheme is again based on two dimensions: Whether the development is primarily done for others (Category 1) or self (Category 2 and 3) and the degree to which the development work is creative or proactive (Category 3).

These categorization schemes provide valuable insights into the characteristics and attributes of users involved in development activities. They are less useful, however, for defining the roles played by information system actors.

The concept of role is behavioral rather than attributional; these schemes mix behavioral and attributional dimensions.

Davis (1985) developed a three-level categorization scheme which is entirely behavioral:

1. Direct user
2. Autonomous user
3. Indirect user

Direct users themselves interact with the computer based information system. Indirect users interact with the computer through analysts or assistants. Autonomous users develop simple systems for their own use. While this scheme is not attributional, it neglects the behavioral distinction between development done for others or self.

The following framework is proposed as a means of classifying information system roles in a way that can be used for role behavior analysis. It combines the behavioral dimensions found in the schemes above, and also takes into consideration the functional purpose of an actor's organizational behavior. Table 2 is a matrix which classifies IS roles in terms of two activity-oriented dimensions. The column headings describe patterns of activities which relate to the construction and use of the information system itself. The column headings are arranged along a using/providing dimension. The centermost columns represent more intense contact with the information system. The row headings describe types of activities involved in the performance of an individual's organizational function. Each cell represents a generic role relative to both the organization and its information systems.

Table 2. Information System Role Matrix

	USER ONLY		USER/PROVIDER	PROVIDER ONLY	
	Indirect User	Direct User	Autonomous Developer	Traditional Developer	Facilitator
Clerical					
Managerial					
Professional					

The five categories on the Information System activity dimension are defined as follows:

Indirect User: Uses output from the information system, but does not personally interact with it. When playing this role, an actor uses IS outputs which have been filtered by others who are likely to be direct users.

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Direct User. Has hands-on direct interaction with information system inputs and/or outputs. This category covers a broad range of activities which could include batch data entry, use of standard output reports, or interactive modeling for decision support.

Autonomous Developer. Similar to Davis' Autonomous User category. Develops applications for his/her own use, typically making use of fourth generation languages or spreadsheets, but may use more traditional tools such as COBOL, APL, etc. Autonomous developers typically perform all system construction tasks such as planning, analysis, design, programming, testing, etc.

Traditional Developer. Performs the same system construction tasks as the Autonomous Developer, but the application is for the use of others. Most traditional IS activities would fall within this classification, as would McLean's DP professional, Rivard and Huff's Micro-DP department users, and many activities performed by Rockart and Flannery's Functional Support Personnel, EUC Support Personnel and DP Programmers.

Facilitator. Performs tasks specifically intended to communicate information about the IS to those playing other roles. These activities may include conveying or eliciting information requirements, system training, or documenting. Many of the tasks performed by information center personnel, "chauffeurs," and functional support staff (as defined by Rockart and Flannery) would fall into this category.

The three categories on the Organizational Activity dimension are defined as follows:

Clerical. When playing this role, an actor is involved in the manipulation of data as an end in itself. The organizational purpose of the manipulation is outside the domain of the clerical role.

Professional. This actor is a knowledge worker who uses information in the performance of functional (non-managerial) activities, such as analysis, planning, or research.

Managerial. A manager directs the work of others and/ or is responsible for allocating organizational resources.

We should note once again that it is possible, and indeed likely, that a number of these roles may be combined into one organizational position. For example, it is not unusual for a middle manager to sometimes work in what has been here labeled the *professional* role and at other times in the *managerial* role. Role theory asserts that, however roles are combined into positions, one role is at any given moment active, the others temporarily remaining latent (Bates 1956).

It might be argued that the categories on each dimension can be more finely divided, and there is no doubt that

this is true. Just as Figure 1 shows how family roles such as husband or father can be legitimately subdivided into finer, discrete roles, so might the developer roles be subdivided into planner, analyst, designer, and so on. But it must be remembered that notions such as *role*, abstractions created by researchers and theorists, only have value according to their analytical usefulness. As this early stage of theory building in IS, the broad, generic role categories presented here are believed to be sufficient for hypothesis generation and testing. Further elaboration can wait until the general approach of applying role theory to IS phenomena has proven useful. The next section describes a program for research into IS role effects which uses the role matrix described above.

4. A PROGRAM OF RESEARCH INTO IS ROLE EFFECTS

A research program using role theory to investigate EUD logically can be expected to pass through three phases.

4.1 Descriptive Research Using the Role Matrix

The goal in this phase is to determine whether the role matrix is a useful tool for classifying IS activities. The EUD literature makes it clear that IS roles are being combined in new ways in many organizations. Descriptive research would sharpen our understanding of just how these combinations are occurring.

For example, to what extent are formal positions containing programmer and developer roles being created? In one study (Rivard and Huff 1985), a number of end-user developers had job titles such as "programmer" or "analyst" which recognized their IS activities. Another study (Sumner and Klepper 1987), however, presumably due to sampling differences, reports that none of the user-developers had such job titles. A related question concerns user-developers' self-perceptions. In both of the studies cited, developers reported that they did not think of themselves as doing "data processing" jobs, even though in some cases they spent as much as 80 percent of their time programming.

The EUD literature also seems to suggest that consolidation of IS roles is occurring primarily at the professional level and not at the clerical or managerial levels. Of particular interest in this regard is the developer-manager cells in the role matrix. If "ownership" of the development process has traditionally been in the IS department rather than in user departments, then the traditional developer-manager role would have been located in an IS department position. Typically, this cell would not have been filled in user organizations. The cell might still be empty, with professionals most commonly occupying EUD development roles. This disappearance of the manager-developer role -- in both user and IS organiza-

tion -- may account for the lack of development discipline often noted in EUD activities.

4.2 Define and Operationalize Variables: Build Models

If the focus on IS roles proves descriptively useful, a model of organizational role effects could be built. The factors affecting the level of role conflict listed above provide a beginning. These and other variables could be defined and operationalized.

The concept of *relative authority*, for example, could be sharpened to describe something more akin to *locus of IS decisions* (Zmud 1987), rather than traditional hierarchical authority levels. This definition of the authority variable might better illuminate the ownership and political issues related to IS development. Likewise, the organizational distance variable needs to better reflect the realities of modern knowledge/service-based organizational structures. Formal organization-chart boundaries fail to reflect the network effects (Ware 1987) of collateral and matrix structures commonly found today. The emphasis on lateral communication, small teams, project orientation and flexibility creates a dynamic structural environment that complicates the measurement of organizational distance.

4.3 Generate and Test Hypotheses Based on the Models

Generation of hypotheses from a "phase 2" model is obviously premature at this point. Nonetheless, several tentative general propositions derived from the application of role theory to EUD can be used to illustrate how the theory might be investigated.

a) As EUD advances in an organization, the users' role-bargaining position strengthens because:

- There is less organizational distance between user and developer roles

- There is less chance of a relative authority disadvantage vis-a-vis the IS department

- Functional dependence on the IS department is reduced

These factors should result in lower perceived inter-sender role conflict in the user organization.

b) As EUD advances in an organization, the IS department's role-bargaining position weakens because:

- A new role relationship -- IS developer to user-developer -- is created. It spans a greater organ-

izational distance than developer-to-developer relationships within the IS department

- The users' functional dependency on the IS department is reduced

- The users' ability to observe, understand and evaluate the IS department's role-performance is increased

- The IS department's ability to take advantage of observable, conflicting user demands is reduced

These factors should result in higher perceived inter-sender role conflict in the IS organization

c) As EUD advances in an organization, the level of interrole conflict, role overload and role ambiguity in the user organization will increase.

As individuals in user organizations assume developer and programmer roles, conflicts between the demands of those roles and their traditional user roles will become visible. (E.g., developer responsibilities such as data security, data integrity, adequate backup, etc., are currently being ignored by end-user developers. As they attend to these issues, interrole conflict and/or role overload will increase.)

5. SUMMARY AND CONCLUSIONS

The recent dramatic and interesting advances in computer technology have significantly altered the roles of both users and developers. Role theory might be applied to more fully understand and more effectively investigate organizational, behavioral, and social issues related to these changes. Role theory can provide the basis for a research framework, can provide a common language, and can contribute to the building of a cumulative research tradition.

A framework for categorizing information systems roles is built from a matrix of information system and organizational activities. The information system activity dimension is composed of indirect user, direct user, autonomous developer, traditional developer, and facilitator categories. The organizational activity dimension contains clerical, professional, and managerial categories.

The resulting matrix can facilitate research in three phases. Descriptive research can identify how roles are being combined and identify roles that do not presently exist. Model building will assist in definition and operationalization of relevant variables. Finally, hypotheses suggested by the model-building phase can be tested.

The IS research community has begun to be more sensitive to the social aspects of information system usage in

organizations. Role theory might prove to be useful for theory development and hypothesis testing, providing a firmly-grounded theoretical model of these social aspects. The resulting improved understanding of current conflicts and ambiguities can be valuable for both researchers and practitioners in the field.

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7. ENDNOTES

1. This paper is under consideration by *Information Systems Research*.