



GROWING PAINS IN INFORMATION SYSTEMS: TRANSFORMING THE IS ORGANIZATION FOR CLIENT/SERVER DEVELOPMENT

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ABSTRACT

Information systems (IS) groups are under increasing pressure to contribute to organizational performance and to support, or even drive, broad organizational transformation efforts through the successful exploitation of information technology (IT). Using a "sociocentric" model of organizational work, this paper analyzes the experiences of one company's IS group that recently embarked on a long-term, enterprise-wide client/server system development initiative designed to transform organizational decision support processes. Even though the client/server initiative is still in its infancy and has not yet delivered high-impact applications, it has brought about substantial changes in the nature of work in the IS group. These changes range from new philosophies, methodologies, and technologies to shifts in the skills, communication patterns, and control structures required to develop and manage information systems.

managers must cope with increasingly competitive business climates, senior management concerns over the "payoff" provided by information technology (IT) investment, new technologies that provide staggering price/performance improvements, and increasing requirements in work force skills needed to use and manage IT effectively. Additional pressure arises from broad organizational change initiatives such as process reengineering, quality management, downsizing, employee empowerment, and transitions to flexible and adaptable forms of organizations. While IS is often asked to support, drive, or manage such transformations through successful exploitation of IT, development and delivery of information systems in these contexts often requires significant changes in the types of information systems that are developed, the development approaches that are used, and the nature of IS work and work skills that are needed.

INTRODUCTION

Client/server developers have to know at least ten times more. We have to know the server back-end, the desktop front-end, plus the middleware, which means we need to learn new desktop (e.g., Windows) and LAN skills. - Programmer

We have to switch our thinking philosophy from figuring out the answer, which systems people have always been good at, to figuring out the question. If you don't know the question, you can't figure out the answer. - Vice President of IS

Pressure is mounting on information systems (IS) organizations to contribute to overall organizational success. IS

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This paper utilizes Heydebrand's (1989) "sociocentric" model of organizational form to describe potential changes in the nature of IS work in organizations undergoing socio-technical transformation. It demonstrates these potential changes through the experiences of the IS group at National Semiconductor Corporation (NSC), a large high-tech manufacturing firm that is in the midst of significant and wide-ranging organizational change. NSC's IS group is attempting to support broad organizational transformation through a major, but difficult, shift towards client/server-based decision support. The organization is still in the early stages of a long, uncertain, and significant socio-technical transformation, and individuals are struggling to understand, accept, and adapt to the significant changes required.

As a result, the client/server initiative cannot yet be considered a major success. Viewed as developments-in-process, however, the study findings provide notable insight into major dimensions of work that have been affected as the IS organization attempts to adopt a fundamentally new information systems philosophy. Although the generaliza-

bility of case study findings is limited, the issues encountered in this organization may not be unique. Major difficulties in NSC's client/server initiative concern not only technology, but also skills, attitudes and social relations. Thus, changes observed in these fundamental dimensions of work may be broadly relevant in organizational contexts where significant socio-technical change is required to accomplish a goal of greater flexibility and adaptability through information systems.

RESEARCH FRAMEWORK

Heydebrand (1989) describes a sociocentric perspective of organizational structure that distinguishes between organizational forms. He describes changes in six social dimensions of work that characterize emergent forms of postindustrial organizations. Many of these changes in the nature of work, which are summarized in Table 1, can be used to evaluate major transformations that are taking place within organizations, both for the entire organization and in IS groups (Nance and Sessions, 1993).

Size of the Labor Force. Many emergent, postindustrial organizations derive their innovativeness, flexibility, and entrepreneurial nature from their small size (Hage, 1988). In order to compete with such dynamic and flexible competitors, many large organizations have "downsized" through significant reductions in staffing (Bahrami, 1992). Since IT can replace many communication and control work activities (Gleckman, 1993; Bahrami, 1992), management-level personnel have been a particular focus of recent staffing cutbacks (Gleckman, 1993; Shrednick, et al., 1992). These downsizing initiatives may hit IS manage-

ment particularly hard as client/server and desktop computing environments push responsibility for managing IT development and usage into user areas (Nance and Sessions, 1993; Schatz, 1993).

Object of Labor. Postindustrial forms are often characterized by a shift in the focus of work from commodity production to symbol manipulation (i.e., information processing) and/or service delivery (Bell, 1973). The increased volume of "knowledge work" and the growing interest in total quality management (TQM) in organizations reflect this shift, and IT is often considered a primary mechanism for improving both types of work activities. In knowledge work, for example, work activities focus on information processing or symbol manipulation, and knowledge workers often rely on IT for improving productivity since it provides functionalities that support these types of activities (Davis, et al., 1992). In TQM, heightened awareness of the need to serve customers is key to improving quality (Shrednick, et al., 1992), and improved customer service, in turn, relies upon IT's ability to summarize operational data for decision makers' use in process improvement decisions (Davenport, 1993; King, 1993).

Means of Labor. Changes in the tools, technologies, and other "means of production" often signify major organizational changes. At a broad level, the societal shift from a production economy to information processing and service delivery has been largely enabled by increased use of IT that "informs" (Zuboff, 1988) the work activities of individuals in postindustrial organizations (Huber, 1990). In IS development, many organizations have turned to technologies such as CASE tools, GUI interfaces, and object-

<u>Dimension of Work</u>	<u>Shifting to a "postindustrial" form may involve ...</u>
<i>Size of Labor Force</i>	... reducing the organization's size.
<i>Object of Labor</i>	... changing from commodity production to an information processing or service delivery focus.
<i>Means of Labor</i>	... changes in the tools, technologies, or "means of production" used.
<i>Division of Labor</i>	... changes in the division of labor used to complete work activities. ... changes in the skill composition of the work force.
<i>Control of Labor</i>	... changes in authority and control at the work level.
<i>Ownership & Control</i>	... changes in authority and control at the institutional level.

**Table 1. Changing Social Dimensions of Organizational Form
(from Heydebrand, 1989)**

oriented databases (Ballou, 1993) that are especially appropriate for client/server development (Nash, 1993).

Division of Labor. Changes in the division of labor, both structural and individual, are another dimension of labor that typify changes in work. At a structural level, post-industrial organizations replace functional differentiation and departmental segregation with cross-functional, team-based, integrated structures requiring a high degree of coordination and cooperation (Taylor and Hobday, 1992; Mintzberg, 1991; Rockart and Short, 1989). At an individual level, the occupational requirements of the postindustrial labor force reflect a growing need for skills that stretch across functional boundaries and encompass a wide variety of new technologies (Bahrami, 1992; Nelson, 1991). In the IS field, the required skill set has broadened substantially beyond the scope of technology concerns to also include an understanding of business processes, customer service, and communication capabilities (Nelson, 1991; Zmud, 1983).

Control of Labor. The final two dimensions of labor in Heydebrand's framework of organizational work are issues of power, authority and control. The first dimension, control of labor, operates at the level of the labor process and focuses on the degree to which workers closest to the point of work production have authority and control over their work activities. "Empowerment" is emphasized in postindustrial organizations, often through a "peer-to-peer" employer-employee relationship (Bahrami, 1992) that enables workers at all levels to make key decisions related to their work activities (Shrednick, et al., 1992). Empowerment is especially important for TQM, both across the organization and within the IS group. In the well-publicized case of Corning Inc.'s Information Services Division (ISD), for example, empowered "self-managing" teams have had great success in supporting the company's renowned TQM program (Shrednick, et al., 1992). While IT is sometimes used as an enabler of change, many of the TQM improvements in Corning's ISD are simply the result of granting workers the right to implement process and policy changes without requiring substantial hierarchical authorization.

Ownership and Control. The final dimension of labor in Heydebrand's framework focuses on overall institutional control structures. Postindustrial organizations are "clanlike, neopatrimonial, flexible, informal, decentralized yet culturally integrated network relations" (Heydebrand, 1989, p. 327) rather than hierarchical or bureaucratic. In IS management, the appropriateness of centralized versus decentralized structures is an on-going debate (Cash, et al. 1992). In many cases, decentralized IS management structures are needed to enable local tailoring of information services and systems (Ives and Jarvenpaa,

1992). But increased use of distributed computing and client/server technology may also increase the need for some forms of central oversight. As users take initiative and responsibility for local information processing, the likelihood of problems such as duplicated system development effort, incompatible technologies, and inconsistent data standards also increases, which may call for broad, centralized control structures at information architecture or technology infrastructure levels (Margolis, 1993; Goodhue, et al., 1992a, 1992b).

RESEARCH METHODOLOGY

A case study research project was conducted to explore potential changes in IS work resulting from the adoption and development of new technologies. The study involved a series of semistructured interviews with individuals from user areas and from corporate MIS at National Semiconductor Corporation (NSC), a large, high-tech manufacturer of semiconductors located in Silicon Valley. NSC's Vice President of Information Systems served as corporate sponsor for the research and also participated as a respondent.

An initial set of interview questions was developed using Heydebrand's dimensions of human labor as a guide for themes to be covered. Four individuals (the user visionary, two system developers, and one system manager) with major involvement in the development and management of the first client/server application (called SMART) were interviewed, covering questions on content issues and on the appropriateness of the question themes relative to the status of the organization's client/server environment. The interview guideline was then refined for the remainder of the interviews (the Appendix contains the final questions).

Following the initial interviews, individuals drawn primarily from the SMART system's current user list were asked to participate in the interviews. Of the 30 individuals contacted, 22 agreed, a 73% participation rate. Twelve individuals, ranging from programmer/analysts to the vice president, comprised a corporate MIS respondent group. The other ten comprised a user group, representing areas such as Marketing, Finance, Operations, and a wholly-owned subsidiary, and included three vice presidents, three directors, three managers, and one controller.

Respondents were interviewed for approximately one hour each at their workplace. Detailed interview notes were recorded and transcribed into a standardized outline form. After all interviews were completed, responses were analyzed by creating summary documents that (a) grouped all comments by user versus MIS respondent groups and (b) classified the responses relative to themes in Heydebrand's framework. The case that follows provides the results of these analyses. Throughout the case, respondent quotes

that are indicative of general themes of responses are displayed in double-indented italics.

A CASE IN IS MANAGEMENT AND CLIENT/SERVER COMPUTING

National Semiconductor Corporation is an organization in the midst of significant transformation. Although the organizational change objectives extend beyond the MIS group, one of the major focal points for the company's transformation efforts is improved IS development and usage. This analysis explores the major changes that have been required in the MIS group as the company has begun to develop and implement client/server systems. It also highlights lessons that have been learned regarding the depths of socio-technical change that have been (and still are) required as the IS work force tries to adapt to a fundamentally new information management environment.

Organization and MIS Area Profile

The 11th largest firm in Silicon Valley, National Semiconductor maintains global operating facilities in the Far East and Europe as well as throughout North America. Like many computer and high-tech manufacturers, NSC has had major financial difficulties in recent years, suffering steady losses from the mid-1980's through 1992. Recent financial results, however, indicate a significant turnaround, with revenues in 1993 increasing to over \$2 billion, profits rebounding to \$130 million, and the stock price increasing from \$4 to over \$20 per share in the past two years.

Several major organizational change initiatives designed to improve NSC's competitiveness and flexibility have been introduced by the new CEO, who joined NSC in 1991. One significant action was the hiring of a new Vice President of Information Systems in 1992. Given a broad charter to develop and implement a vision for global information processing and management at NSC, the new VP describes his primary job responsibility as "become a business partner with our customers so they become successful, and in the process, be a change agent and accelerate the rate of change throughout National Semiconductor."

IS management at NSC has traditionally focused on centralized mainframe COBOL operational applications. The IS group has been insulated from user areas both physically and philosophically, located in a separate building and emphasizing technical issues such as machine cycles and storage efficiency. Development of decision support systems has been almost non-existent, with massive periodic paper reports pulled from mainframe operational systems the only information outputs available from MIS. The vast majority of information currently used for decision support throughout the organization are reports produced by

FOCUS programmers hired by user-area managers as embedded "scribes" to produce ad hoc reports.

Development and Status of the Client/Server Initiative

About two years ago, we were approached by a marketing manager who had a vision for a decision support system and wanted to know how to do it. It was intriguing because it was a new way of doing things. Our job was to find out how the idea might work.

The client/server initiative at NSC essentially began in 1991 when a marketing manager and his embedded FOCUS programmer discussed the concept of a centralized marketing database that would extract data from production systems and allow remote user access to the data. Users could access the database at high levels of data aggregation, drill down to the level of detail needed, and perhaps download data locally for analysis. The two marketing users approached an MIS manager with the idea, who bought into it despite the inherent risks in a system requiring new technologies, new development approaches, and a new information management philosophy.

After numerous technical, financial, and political discussions among MIS management, the MIS manager was put in charge of a cross-functional project team formed to proceed with system development. Approximately one year later, after several prototype iterations and user demonstrations, the initial application, called SMART, was rolled out using a mainframe relational database (DB2) on the back-end, a desktop graphical interface (Excel) on the front-end, and Ethernet connections with SQL queries for remote access, all of which represented fundamentally new technologies within the organization.

I was excited because it was impressive and captures your imagination. But I was a little nervous about whether we could pull it all together because there were lots of pieces. I kind of expected this might be my first failed project.

The development group's initial reactions to the client/server project were mixed. A variety of technical problems, such as access time and connecting MacIntosh computers to the network, slowed implementation and raised questions about the project's technical feasibility. Their enthusiasm increased over time, though, as their technical concerns were alleviated. But their response to an early user complaint, lack of ad hoc query capabilities, reflected the classic MIS philosophy: for reasons of response time efficiency, they intentionally designed the system to limit queries to certain key classes of inquiry. Users continue to

request true ad hoc query capabilities, and MIS has only recently begun to deliver them.

Approximately 120 individuals in the organization are currently on the SMART system user list. A number of people use SMART to retrieve information on an occasional basis, but few use it heavily and many do not use it at all. Although MIS is upgrading SMART's capabilities and is increasing its marketing of the system, SMART as a specific application has not yet become a major provider of information in the organization.

SMART helped change the mindset of the company. The concept that we don't have to do everything off the mainframe and a terminal has finally sunk in. The prototype approach is doable. The graphical interface is doable. Users can demand that the darn thing works and look right to them up front. And they can reject it if it's not. It's a mindset.

One key event that took place during the development of SMART was a decision to distinguish between the underlying physical DB2 database, called the *decision-support database (DSDB)*, and *application specific databases (ASDBs)*. With the ASDB concept, data is extracted from the DSDB into subdatabases designed to meet specific data needs for different applications. ASDBs were initially developed for SMART and for a European financial application, and several more ASDBs have been created for subsequent systems. All ASDBs draw data from the core DSDB and queries then run against the appropriate ASDB rather than against the DSDB. The effect of this application portfolio structure has been to greatly ease and speed up the development process across a number of subsequent applications.

In sum, the primary client/server application developed so far, SMART, has not yet provided major benefits as an application in its own right, although it is in use and its capabilities are being upgraded and marketed more heavily. SMART has had a substantial effect on NSC's overall computing environment, however, by stimulating a change in systems philosophy. In perhaps the most significant event of all, NSC entered into a long-term contract in late 1993 with a major technology vendor to engage in a large-scale, long-run cooperative venture to develop and implement client/server applications widely through the organization.

Lessons Learned

Finally, we turn to the analysis of the nature of IS work changes within Heydebrand's framework of labor in postindustrial forms of organizations.

Size of the Labor Force

I came to NSC two years ago because it appears to be moving, appropriately so, towards a smaller, more responsive IS organization.

The client/server environment will result in fewer MIS managers with a flatter reporting structure.

The biggest thing we can do is make FOCUS go away.

Respondents felt that significant changes in the size of the MIS labor force are likely to accompany development of client/server systems. In user areas, the move towards client/server may reduce the need for embedded FOCUS programmers as managers gain greater personal access to the data. In the corporate IS group, MIS personnel clearly believe that the need for managers in the MIS area will decrease and that the MIS management structure will flatten and shrink, since client/server transfers a significant amount of responsibility for managing IT to user areas (discussed below). These changes have not yet occurred, though, due to the early state of the client/server initiative.

Object of Labor

MIS has always considered themselves a group to be served, not a service group.

Traditional MIS doesn't have customers, they have hostages. That changes with client/server because the data is available and users can use it ad hoc.

We are trying to visibly increase our customer interactions. The intention is to increase our emphasis on MIS' attachment to business. We are focusing on getting out to know the customers.

There has been a notable shift in the MIS group towards a customer service focus. The traditional MIS culture at NSC has not been "user-friendly," but has viewed users as a captive market who had little or no say in information system development activities. But SMART and the DSDB changed the mindset of the MIS group. A Total Quality Manager position has been created and assigned responsibility for marketing MIS and monitoring MIS customer satisfaction. MIS "customer service agents" have been designated to solidify linkages between corporate MIS and key user groups. Many system developers now realize that the focus of their work activities is shifting from building technically efficient systems to developing business solutions as defined by the user community. They also realize they need to spend time out in user areas interviewing users and observing work activities before beginning system development.

MIS will be more in the business of collecting data, providing access, and helping users throughout the company get at it. There will be a shift away from application development to two activities: data management and business analysis.

In addition to the increased focus on customer service, there is some sentiment that the focus of MIS work in a client/server environment may also change from design and delivery of systems (i.e., production) to more analytical and managerial activities (i.e., information processing). Combined with the increased emphasis on service delivery, such a transformation would clearly reflect a change towards Heydebrand's postindustrial form of organizational work.

Means of Labor

With client/server, you turn the development process upside down. Now, we tend to use development approaches that make sense for the situation rather than following well-defined methodologies. The philosophy is to have the data in a logical, coherent form, then build applications to take advantage of the availability of the data.

The standardization of relational technology and SQL is at the heart of client/server, but so is the desktop technology. The presentation, ease of use and graphical interface are what capture the imagination. It's a combination of those two technologies, along with the big improvement in communications technology.

Changes in the means of production for developing client/server systems are wide-ranging, involving new development methodologies and a much broader set of technologies to be included in system implementations. Respondents consistently suggested that iterative, prototyping approaches are the only feasible methodologies in client/server development. Continuous user feedback and testing of components such as interfaces, query structures, and documentation manuals is required to ensure system usability.

Technologies influencing system development include back-end servers and relational databases, networks for remote and local access, and multi-platform hardware and software desktop capabilities. Not surprisingly, MIS personnel have many more reservations than users about the current state of client/server technology, and these differences have resulted in several conflicts during system development activities. Users, for example, want transparent DSDB access through MacIntoshes, but MIS has had difficulty modifying Intel/DOS-based connections. Users want complete ad hoc query capabilities, but MIS has only been able to lower the response time for large multi-file joins down to several minutes, which users do not consider acceptable. In short,

users continue to want greater capabilities and services, while MIS struggles to master the new technologies.

Division of Labor

We used to be able to tell the user "this must be" for technical reasons and get away with it. Today, users are much more knowledgeable and it is much more of a team approach, with neither side telling the other what to do.

You talk to a different target audience. Before, I used to interact with a lot of analysts and programmers, trying to reconcile their numbers. Now, I work directly with the knowledge workers rather than with the solution providers.

Even though the overall status of client/server computing is not far along, the structural division of labor has already changed significantly. Users and MIS personnel report that interactions are more cooperative, team-oriented, and partnership-based. Although these changes are occurring across the organization due in part to broad non-IS initiatives, they are also occurring because of the changing information systems and MIS philosophy. Users suggest that increased desktop and client/server computing has made their interactions with MIS less formal and structured and that they have a broader set of MIS contacts. MIS personnel describe a more cooperative, team-based development environment and a notable shift towards interacting with information users, such as managers, rather than with information providers, such as analysts.

MIS skills are much more challenging because of the interdisciplinary nature. People used to know small areas in great depth, but with client/server, the areas are much broader and you can't know them in such depth.

As you move to distributed computing, systems development people must learn increasingly sophisticated aspects of management.

MIS skills required to work in a client/server environment cover a broad range of abilities. Technical skills, in one programmer's words, require a "ten-fold" increase in ability to work with all components of the system architecture, including both hardware and software on mainframes, PCs, and networks. But technical skills are only one dimension. Additional MIS skills required for client/server environments include much broader analytical and problem-solving abilities to "figure out questions rather than answers," strong political skills to "form informal relationships required to get things done," and strong business knowledge to develop a "customer service mentality."

Control of Labor

Users argue that it is too hard to get at the information they need to do their job. They want to set up their own mechanisms for information management -- systems, people, tools -- since MIS takes too long to deliver.

Now, users can take control -- they have the money, the IT, even their own programmers. They used to turn to MIS as specialists.

Everyone recognizes the need for some local control over IT usage and management. Users strongly believe that local management of data and IT is justified and critical for decision-making speed. Although they note that NSC's current client/server capabilities are not yet there, users feel that client/server technology should eventually eliminate information intermediaries by providing (a) quick and easy access to data, wherever it may be, and (b) ability to download the desired data for local analysis if needed.

MIS personnel generally agree. They recognize the need for speed and access to information in decision making. But while they are starting to accept user management of data and IT, they are hesitant to turn over total responsibility. This is partly due to concern over resources and job security, but it is also due to concern about the general lack of oversight when users "do it their own way."

Ownership and Control

At the management level, MIS managers sit on Customer Councils, which is relatively new and indicates a value in having MIS there.

At the working level, we are moving towards a more decentralized structure, with MIS staff physically located out in the product groups, closer to their customers.

IS management at NSC is involved in significant structural changes. Executive-level management is becoming more visible and influential in enterprise-wide administration. System developers are moving from the corporate MIS building into their respective user communities' work areas. Interestingly, though, many users were unaware of the structural transformations that are occurring and suggested ideas that have already taken place. This lack of awareness about structural changes points to a significant need for MIS to increase its marketing visibility.

The MIS role in a client/server environment will be standards, architecture, and corporate contracts -- things that cut across the company horizontally.

Most unsuccessful client/server efforts fail because there is no clear document for establishing standards and testing for conformance. We prepared a broad document describing a methodology for implementing client/server that includes principles, definitions, standards, and a roadmap for years into the future.

Finally, respondents consistently viewed the primary role of MIS in the future client/server environment as broad infrastructure and architecture oversight. The few users who voiced an opinion tended to naturally cede responsibility to MIS. But MIS strongly considered themselves to be the only area in the organization capable of taking on this leadership role. Understanding the technical complexities of networked environments is one reason, but an even stronger rationale is the need for an organization-wide perspective. A global data standardization and centralization effort is currently in process; Ethernet systems are being implemented globally requiring cross-site communication; and an enterprise-wide business process reengineering initiative is under way, led by the Vice President of Information Systems. Given these types of systems initiatives, MIS may well be the area best suited to set and manage organization-wide information architectures and technical infrastructures.

CONCLUSIONS

Major successes have not yet been seen in NSC's initiative to develop client/server applications, as individuals in MIS are still struggling to learn new technologies, new development approaches, and general business requirements. But even its early stages, the initiative has led to major changes in the company's approach to delivering and managing IT. In fact, in the organization's overall reengineering and organizational transformation efforts, the MIS area may be undergoing some of the most substantial change of all. The required skill set for the systems development group has increased substantially, forcing IS personnel to take a broader, more analytical and customer-oriented view of their work. Interactions with users are increasingly cooperative and are shifting in terms of frequency, structure, and categories of contacts. Control over management of data and IT is shifting from MIS to users, and structural MIS management is becoming more involved in a range of administrative organizational networks.

So, in closing, the IS effort to institute socio-technical change through development of client/server systems appears to be off to a good start. However, the extent to which these changes ultimately contribute to the company's goal of increased flexibility and competitive success remains to be seen.

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**APPENDIX
RESEARCH INTERVIEW GUIDE**

Background

- What is your official title?
- Please briefly describe your job responsibilities.
- (MIS) What are the major information systems in which you have been involved in system development in recent years? Which have you worked on most heavily?
- (User) From which information systems can you, and do you typically, acquire information needed for your job?
- What is the nature of your involvement or interaction with SMART or other client/server information systems? How often/heavy is your interaction?

Introduction to SMART and Client/Server Computing

- When and how did you first hear about the (SMART/field sales) system? What was your initial reaction when you first heard about it?
- What did you expect the system to be able to do?
- What changes did you anticipate in your work activities resulting from use of the system?

Current Status

- What is your overall impression of the system? Strengths? Weaknesses?
- (User) What information is available to meet the needs of your job? Has it changed as a result of the new system?
- How accurate is the information?

Work Interactions

- Before the development of this system, whom did you consider to be the "customer" of your job's outputs? Has that changed due to the new system?
- Whom did you consider to be the "supplier" of your job's information inputs? Has it changed?
- What was your level of interaction with user/MIS personnel? Who were they? Has it changed?

Work Changes Resulting from SMART and/or Client/Server Computing

- How substantial have the changes been in the:
 - types of job activities you perform?
 - tools, technologies and methodologies you use?
 - skills required to do your job?
 - level of authority, visibility, accountability in your work?

General Management Philosophy

- Have you seen any notable changes in user/MIS activities or philosophies?
- If you were in charge of the SMART or client/server information system initiative:
 1. what would you have done differently, say, two years ago?
 2. what would you do at this time?
 3. what would your vision be for 5-10 years from now?
 4. what organizational changes would take place if the vision came to be?