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THE IMPACT OF INFORMATION TECHNOLOGY
ON DECISION-MAKING IN THE WORKPLACE

by

Patricia Joan Reed

A thesis submitted in conformity with the requirements
for the degree of Doctor of Education
Department of Adult Education, Community Development and
Counselling Psychology
Ontario Institute for Studies in Education of the
University of Toronto

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Doctor of Education 1998
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ABSTRACT

The impact of new information technology on decision-making by front-line workers was studied. A semi-structured interview process was undertaken with 44 sales employees who had their jobs redesigned to incorporate computer technology in a Canadian customs brokerage company. The technology provided job enrichment and created opportunities for improving the quality of worklife by expanding peoples' skills and supporting them to be more efficient, more organized, better able to manage time and more productive. The technical features of the information technology did not provide sufficient support to decentralize decision-making from management to front-line workers, this continued to be based on managerial choices about the organization of the work. It is concluded that information technology offers the potential to provide more job autonomy and responsibility for decision-making for individuals in their job but cannot determine the social, psychological or organizational changes of its introduction. This depends on how management chooses to incorporate the technology into the organizational structure.
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Chapter 1: Introduction

The purpose of this research was to explore the impact of the introduction of information technology on decision-making and job autonomy experienced by front-line workers in an existing company. The theoretical organizational model of sociotechnical systems design was used as a basis for the investigation. The study examined information flow, internal communication processes, organizational learning and how decisions were made from the perspective of the workers who were expected to implement the use of the new technology in their redesigned jobs.

We are experiencing a dramatic shift in the form of job loss and dislocation evident in the “downsizing”, “resizing”, “restructuring” and “re-engineering” that many companies are currently enacting. Hierarchies are collapsing and organizations are creating flatter team-based structures with far fewer levels of management. Jobs are being redefined to be more self-managed with more decisions being made by front line employees. These changes are partially being directed by economics with businesses trying to survive and thrive in a global economy, but they are also being directed by more knowledgeable and educated employees who expect more democratic workplaces.

Simultaneously, information technology is exploding into our lives at an unprecedented rate. Microcomputer networks linked to powerful new database technologies have made information management the central activity supporting organizations. Now people at every level of the corporate ladder have the potential to access the same information. When a company advances from number crunching to distributed information systems, its decision processes, management structure, employee
relationships and the entire way it does business change. Decisions can be communicated without relying on a management chain of command. Information technology (IT) demands a shift to knowledge workers who direct and discipline their own performance (Drucker, 1988). Naisbitt (1994) states, “In an industrial society the strategic resource is capital. In the new information society, that key resource has shifted to information, knowledge, creativity. And there is only one place where the corporation can mine this valuable new resource - in its employees” (p. 20). According to Thach and Woodman (1994), “The organization of the future is likely to be affected by innovations in IT in such areas as individual work support, group work support, advanced organizational automation and enhanced global communications” (p. 30).

Information is the basis of all decisions. Information technology provides a means of transmitting information quickly and inexpensively to all levels of an organization at the same time. As we move forward through the “information age”, our ability to gather, synthesize, organize, monitor and disseminate information is increased dramatically. Many of the problems of centralization and communication within the organizational hierarchy may be removed. “Potential business improvements - eliminating layers of management and wasted executive time, taking products to market more quickly, spreading out decision making, cultivating flexible customer service - may well succeed or fail based on the enterprise-wide use of information” (Weizer et al., 1991, p. 2). Employees must have access to accurate, opportune and complete information before participation in decision-making can be meaningful. Information technology enables employees at all levels to participate in making quality decisions and offers real potential for employees to influence the organization.
Ever since the computer was first introduced to organizations in the 1950's, management theorists have been intrigued by its potential effects on employment, job content and organizational structure (Robey, 1977). Although most observers agree that information technology has the potential to evoke dramatic consequences for organizations and those employed by them, they cannot agree on what the consequences will be (Long, 1993). Proponents of the technology envisage happy, productive employees working in interesting and challenging jobs that are highly autonomous and make full use of their skills (e.g., Drucker, 1988; Thach & Woodman, 1994; Martin, 1996). Opponents of the technology see a future of high unemployment, centralized management and deskilled employees performing uninteresting work with very limited autonomy (e.g., Littek & Heisig, 1990; Menzies, 1982; Menzies, 1984). Still others argue that neither the positive or negative outcomes of introducing information technology are inevitable, it depends on how management uses the technology and the reactions of employees to changes in their jobs (Walton & Vittori, 1983). Numerous studies have been carried out that examine redesigned workplace environments, including such things as the introduction of work teams, job enrichment, or new management structures. However, empirical evidence of the overall impact of information technology on what happens to people when their work is redesigned is quite limited.

Information technology offers important opportunities to humanize work by decentralizing information and decision-making. Information technology can affect the balance of power within the organizational structure by redistributing information. Information technology makes traditional top-down management virtually impossible because it frees up so many communication channels, gives workers access to abundant
data and permits a tremendous increase in the amount of feedback which can change
decision-making processes (Lawlor, 1991). Researchers suggest that participative
decision-making and job autonomy are linked to perceived control and enhanced job
quality (Evans & Fischer, 1992). Studies indicate that a participative organizational
"climate" and influence over one's job provides a better quality work environment and
increased job satisfaction (Vroom, 1967; Hackman & Oldham, 1980; Miller & Monge,
1986; Spector, 1986). Does working independently on a personal computer provide job
enrichment or job autonomy? Although the technology is now available for
communicating extensively throughout the organization and sharing information and
decision-making, is this the practice? Has information technology had an impact on
organizational change and how and why decisions are made in the workplace? This study
was intended to explore these questions in a currently existing workplace.
1.1: Purpose of Study

The purpose of the research was to explore the impact of the introduction of information technology (IT) on decision-making and job autonomy experienced by employees in a company worksite. The impact of technology was examined from a sociotechnical systems design approach studying the social-psychological perceptions of employees to technological innovation in their jobs. Any change in work relationships or worklife that could be attributed to the introduction of information technology was documented and discussed in the findings.

1.2 Research Questions

This case study addressed four main questions: (1) What changes in the work environment and job are perceived to be the result of introducing information technology? (2) What impact has information technology had on access to company information and on communication processes used by employees? (3) What are the employees’ perceptions of decision-making within their job since the adoption of computerization? (4) What are the employee’s perceptions of job autonomy and job satisfaction since the adoption of computerization?

1.3 Significance of the Research

Today's workers are looking for more satisfying work, greater control over their own work, more opportunities for self development, and increased areas to use their intellectual capabilities. The introduction of new work technologies can provide excellent opportunities for reviewing and revising the structure of work and improving the design
of organizational systems and practices that support the work to make it more satisfying (Hackman & Oldham, 1980). Workplaces usually require changes in jobs and workflow in response to the technological innovations. The changes can be designed to create more motivating jobs or they can be designed to simplify and routinize jobs. The technology itself is relatively neutral about how organizations take advantage of these opportunities.

The degree to which employees experience jobs that are meaningful and worthwhile largely depends on the amount of control they perceive in doing the job, including participation in decision-making in the organization. A critical aspect of making work-related decisions is having access to accurate and current information. Information technology and related communication technologies provide a mechanism for sharing information quickly and easily with all workers. However, the literature seems deficient in this area. Empirical evidence of the overall impact of new information technology on white collar jobs is relatively sparse. Although extensive literature exists on organizational change, little attempt has been made to address how managers or employees perceive the introduction of computer technology and its direct impact on their job. In addition, many researchers have studied electronic communication processes, particularly electronic mail and group dynamics, but information is limited about communication and decision-making through information technology within work environments.

Several studies consider the innovation of information technology with a particular emphasis on technological and economic impacts (Menzies, 1982; Weizer et al., 1991; Tapscott, 1996). However, these impacts cannot be separated from the social and psychological impacts experienced by the people working in the organizations. A
primary anticipated outcome of this research is a descriptive analysis of employees’ perceptions of how the information technology that they use daily at work has affected communication and information-sharing within the organization and subsequently, how and why decisions are made in that organization.

A second proposed outcome of the research was to contribute to an understanding of the impact of information technology on management practices within existing hierarchical structures and thereby, add to the field of organizational management theory. It is anticipated that this study will add to the knowledge about participatory workplaces and individual job autonomy in businesses that have incorporated information technology.

The findings from this study may assist organizations and trainers in the design and delivery of programs that introduce significant change in people’s jobs related to the implementation of information technology. By observing actual events and talking with employees in the work setting, the researcher was seeking explanations which could provide a basis for subsequent predictions about organizational learning. The findings are based on the experience of the employees and may provide valuable insight into best practices for promoting organizational learning and future change efforts.
1.4 Definitions of Terms

**Cold Call:** contacting for the first time (by telephone or visit) a company that is unfamiliar with your business or services.

**Information Technology (IT):**

computer based communication systems including electronic mail, executive information systems, distributed databases, computer mediated conferences, computer supported collaborative work, universal file sharing, electronic bulletin boards and electronic information exchange through the use of computers, modems, cable and computer networks (IT is used interchangeably with Computer Technology in the document).

**Job Autonomy:** the extent to which individual employees can structure and control how and when they do their particular jobs (Spector, 1986).

**Job Enrichment:** making individual work more interesting by having one person responsible for a whole product or service (Lawler, 1986).

**Prospect:** a suspect becomes a prospect when a sales person makes contact and determines that a business opportunity exists.

**Sociotechnical Systems Design Theory:**

jointly examines the organizational structure, technology and job design (equipment and methods) in conjunction with the social needs (people and their relationships) within a work system for optimum performance (Cherns, 1976).

**Suspect:** a company which may or may not have a need for your business; generally there is limited information available about the suspect.

**Work Redesign:** activities that involve the modernization of specific jobs with the intent of increasing both the quality of the work experience of the employee and his or her performance (Hoy & Miskel, 1987).
Chapter 2: Review of the Literature

The following sections examine the impact of technological innovation in work throughout history, including the participation of workers in work-related decisions. Organizational management theory with a specific emphasis on the systems approach of sociotechnical design theory is discussed. The imposition of organizational structures on communication processes and decision-making will be reviewed. Research in the areas of work redesign and job autonomy will be examined more closely. Finally, both the positive and negative proponents for implementing information technology in a work environment will be discussed including the empirical data available to support either argument.

2.1 Historical Overview of Technology and Work

The introduction of new technology has had dramatic impact on society and the nature of work. Throughout history there has been continuous technological change. As long as humans continue to seek easier and faster ways of doing tasks and to expand current knowledge, the momentum for innovation and change will continue.

When people learned to harness fossil fuels for energy in the early 1900’s, the power of steam became the technological catalyst for the industrial revolution. The traditional worker had to move from being an agricultural expert or craftsman in a cottage industry to the role of industrial worker. By 1900, there were 70,000 factories peopled by sixty per cent of the workforce in non-agricultural labour in Canada (Campbell, 1996). The industrial worker became a complement to the machine and was required to use technology that was often independent of human ingenuity in its operation. The
individual worker relinquished more and more decisions about his or her work to the requirements and rhythms of the machine. The idea of working with a product as a skilled labourer through its various stages to completion was lost, to be replaced by production systems consisting of simple, repetitive tasks.

Since the beginning of the industrial revolution there has been reaction to the application of technology. A new technology may displace workers and eliminate occupations as it replaces functions initially performed by individuals. This was evident with the introduction of the tractor in agrarian society and the textile machines in the industrial society. It is also apparent in what may be termed the “information society”. It is the power of knowledge and information and the application of related technologies that is the catalyst for the economic and societal shifts present today (Government of Canada, 1996). Restructuring to an information society represents a staggering social transformation equivalent to the industrial revolution (Menzies, 1996). Work in every part of the economy is being transformed into management information systems.

The introduction of a new innovation produces a climate of turmoil and change with increased complexity in the demands of work. New infrastructures mean economic transformation and growth. Today, computers are transforming workplaces again. For example, in the field of information technology employers have created 972,000 new jobs since 1984 (Crane, 1996). However, there is a big mismatch between the skills and training of the people who are losing their jobs and the needs of the computer industries. The people being displaced in the manufacturing industry do not have the requisite skills for the computer technology positions. The pessimistic view is that technology will result in the permanent displacement of human labour. It is certainly true that specific jobs have
been reduced or entirely replaced. The more optimistic view is that information technology will create more new jobs than it displaces in the long run.

An important characteristic of current technology is the rapid acceleration of change that we are experiencing. The span of time between the development of an innovation and its practical application is significantly decreasing. In the 1800’s, it took fifty-six years from the invention of the telephone to its common use, whereas in the 1960’s it only took two years from the discovery of the solar battery to its practical application (Chen & Regan, 1985). With the introduction of information technology in the early 1980’s, there has been an explosion of computerized communication systems throughout the world. We are living with a logarithmic rate of change. By May, 1997 the Internet had more than 1,000,000 World Wide Web servers in most major countries with more than thirty million Internet users in the US alone (GVU WWW User Survey, 1997). At the end of this decade, the Internet will link several hundred million computers together and the total number of users with access to global electronic information will exceed 500 million people (Mandel, 1993). This has already had phenomenal impact on how people communicate, what information they have access to and ultimately how decisions are made. We are more than half way through the information era, however, we are still operating with industrial-age organizational models from a past era. According to Davis (1996) the information era will “come into its own, with its own appropriate economic and organizational models, as it reaches late middle age” (around year 2010). The late infrastructure of the information era will use the power of computers as connectors to send data, text, sounds and graphic images to transform the way business is conducted.
2.2 Organizational Management Theory

The technological advances that inspired the Industrial Revolution also depended socially on new forms of organization and administration. Less than 100 years ago, businesses borrowed the 'command and control' model that was successfully used in the military for survival at war. This was based on Scientific Management Theory (sometimes called Classical Management Theory) devised by Frederick Taylor. At the beginning of the industrial age in the early 1800's, traditional management approaches considered employees as extensions of the machinery, literally "cogs in the wheels". The belief was that companies were most effective and efficient when employees were instructed and directed. Workers were closely monitored and observed for accuracy and speed under an autocratic leadership. This introduced methods such as the punch clock and bells and whistles indicating pre-determined breaks, time and motion studies with detailed task analysis and performance output targets, shopfloor foremen to supervise, reward and punish performance, and remuneration based on the quantity of work. By the late 1900's the emphasis on productivity through the specialization of tasks had emerged. This culminated in workers doing repetitive, routine, discrete and isolated tasks within the total assembly process.

Although forms of bureaucracy have been around since the 17th century (Samier, 1996) it was largely the work of Max Weber (as translated in 1947) that is attributed with the notion of control through bureaucracy with its policies, rules and hierarchical organizational structures. Authority was seen as attached to the position or level in the hierarchy. Weber suggested that top level executives had authority because their specialized expertise appeared to guarantee the efficiency of the company (Rieger, 1995).
Conformity and compliance were systemically controlled. Advancement “up the corporate ladder” was based on technical skill and performance. The bureaucratic model was used by others to promote efficiency in the organization through enhanced coordination. In that vein, all rules, acts and decisions were recorded in writing and signed off by the appropriate level of power before any acts were implemented. According to Weber, this arrangement led to standardization and consistency across the organization. The organizational structure was highly centralized within a scalar chain of command. Lower level employees were expected to comply with and accept all decisions made on their behalf by the expert managers from above. The more complex and difficult the decision, the further up the hierarchical chain it would go for approval. Formal methods of communication and spheres of influence in making decisions were clearly prescribed and enforced through overt and covert sanctions. Two major dysfunctions of hierarchy that continue today are the opportunities for distorting or blocking critical information both up to the supervisor and down to the employee (Hoy and Miskel, 1987).

Rules and regulations ensure continuity, stability and uniformity across an organization. However, they also produce rigidity and goal displacement (Hoy & Miskel, 1987). In the late 1920’s and early 1930’s organizational theorists began to discuss human beings as more than extensions of machines solely motivated by monetary gain, who required important decisions to be made on their behalf. According to Trist (1981), as a society evolves individuals change their values and expectations concerning work roles and changes in technology bring about changes in values, cognitive structures, life styles, habitats and communications. The Human Relations movement began to examine people’s attitudes about work and motivation factors in work performance. It is through
the human relations approach that employees were considered to be more than hired hands, and instead, an emphasis was placed on communication between “the ranks” both up and down the hierarchy in an organization. The human relations approach and later, organization development also articulated the importance of shared decision-making between upper and lower ranks and the advantages of democratic leadership. The research of Elton Mayo at Western Electric’s Hawthorne Works in 1927 to 1932 demonstrated that providing attention to workers enhanced positive working relationships which improved morale and increased productivity (Rieger, 1995). It was found that improvements in the social context of the work could increase worker satisfaction and the meaningfulness of even boring jobs. As a result of the Hawthorne studies, industrial psychology and organizational development became prominent. Throughout the 1950’s social scientists became more involved in workplace studies about job satisfaction, job enrichment, job motivation and methods for meeting both organizational and individual needs in the workplace. More recently, attempts to improve the work context have extended beyond building interpersonal relationships to innovations in work scheduling such as flex-time and a shortened work week.

The basic flaw in scientific management theory was its neglect of the social system and people’s need for autonomy and control at work; the problem in the human relations approach was its complete disregard of the technical system. To be productive organizations need to consider both the technical dimensions (equipment, work structures) and the social dimensions (formal and informal organization of workers, methods of coordination) of work as continually interacting and adjusting to the broader environment.
2.2.1. Sociotechnical Systems Design Theory

To meet the production needs of an organization and the social-psychological needs of the employees the structure of work systems must be redesigned. A useful theory that underpins this concept is Sociotechnical Systems Design Theory. This theory was developed at the Tavistock Institute in England by Fred Emery and Eric Trist during the 1950’s and 60’s. They studied the high production of natural work groups in the British coal mining industry and observed that the leadership roles that emerged were facilitative rather than directive (Emery & Thorsrud, 1975).

Sociotechnical Systems Design Theory examines the organizational structure, technology and job design (as in classical management theory) in conjunction with the human needs in the workplace (as in human relations theory) within the context of the external environment. Sociotechnical theory maintains that both the tools and procedures to produce a product and the social and psychological conditions of the people using the tools must be examined together to get the best performance and highest quality output. A key feature of the sociotechnical approach to work design is the creation of work systems in which both the social and technical aspects are integrated and as supportive of one another as possible. In his research on quality of work in the mid 1960’s, Emery further described dimensions of the social system (from a sociotechnical perspective) to include the degree of delegation of responsibility, and the degree of reliance on the expertise of workers in making complex judgments and decisions (cited in Pasmore, 1995). Emery considered the symmetrical relationship between management and staff as vitally important and he highly valued the contributions of front-line workers to decision-making in the organization.
It was clear to the human relations theorists that traditional methods for the division of labour with specific, limited tasks used only a small portion of the human potential. Herzberg's (1959) theory of Hygiene-Motivation and McGregor's (1960) Theory Y assumptions offer basic concepts fundamental to sociotechnical systems design. Herzberg's job motivation factors include such things as a sense of achievement, recognition by others and personal responsibility and control in the job. Core assumptions of Theory Y include the beliefs that: 1) work is a natural activity that is not inherently distasteful, 2) the majority of workers will seek self-direction and responsibility, and 3) if workers are viewed and treated as if they detested work their behaviour will conform to that view; however, if workers are offered enriched jobs and opportunities to participate they will accept responsibility and be more productive.

The principles of sociotechnical systems design theory builds on these concepts. The sociotechnical systems design theory emphasizes the ideas that firstly, people will have greater investment in the success of the whole organization when they can influence the quality of their own working life; and secondly, that organizations will more readily achieve their goals when work is planned, organized and designed with (not for) the people who will be doing the work. Sociotechnical systems design emulates these beliefs because it moves the control of the work process from a supervisor to the worker. The sociotechnical systems approach attempts to optimize the social and the technical systems which make up an organization by giving attention to the people, the organization and the technology. It requires changing the organizational structure as it also decentralizes authority and redistributes power throughout the organization. Organizations are seen as interdependent systems, which often leads to the creation of cross-functional teams.
A recent example of this is the privately owned jeans company, Levis Stauss & Co. To keep employees motivated and productive the company decided to work with the Amalgamated Clothing and Textile Workers Union to reorganize workers into teams that would make the entire product from start to finish, eliminating the repetitive piecework of the past (Austin, 1995). High performance work teams are given more information, more control and a greater voice in decision-making.

Cherns (1976) developed nine principles of sociotechnical design. Of particular relevance to this research in the areas of decision-making and job autonomy are the following principles: minimal critical specification, sociotechnical criterion and information flow. These three principles are further described below:

i) Minimal Critical Specification
   It may be quite necessary to be precise about what has to be done, but it is rarely necessary to be precise about how it is to be done. Specifying more than is needed closes possible options. The fewer rules and boundaries there are, the more adaptable and flexible the system.

   When employees are given a minimum of directives from management there is more opportunity for people to be innovative and make decisions about their own work. Information technology and various software programs provide powerful support tools that enable people to work with a high degree of flexibility and limited management direction.

   ii) The Sociotechnical Criterion
       Variance is described as any unprogrammed event. This principle states that variances must be controlled as near to their point of origin as possible. For example, the sociotechnical criterion principle requires that inspection be incorporated with production allowing people to inspect their own work and learn from their own mistakes. "The fewer the variances that are exported from the place where they arise, the fewer the levels of supervision and control that are required and the
more “complete” the jobs of the people concerned, to whom it now becomes possible to allocate an objective and the resources necessary to attain it” (Cherns, 1976, p.787).

This principle presupposes access to relevant information required to make decisions and do the complete job. Information technology facilitates immediate access to abundant information. When individuals feel responsible for their own work (a complete task from start to finish) and are given the opportunity to learn from their own mistakes they are much more satisfied about the job.

iii) Information Flow
This principle states that information should be provided in the first place to the point where action based on that information will be needed.

Properly directed, information technology can supply a work team with the right type and amount of feedback for them to control the variances within their sphere of responsibility and to anticipate events in the future. This principle emphasizes worker control over decisions about their own work, commonly described as job autonomy.

Sociotechnical systems design theory is based on democratic decision-making and self-direction (Pasmore, 1995). An organization that incorporates sociotechnical systems design provides workers with broader responsibilities, full access to information that facilitates continuous improvement and autonomy in problem-solving and decision-making. “The sociotech approach to work design and the total quality management approach both argue for building teams around key workflow interdependencies” (Lawler, 1991, p. 9). Sociotechnical systems design thereby optimizes the relationships of both the social and technological aspects of the workplace. According to Pearson (1992) researchers have continued to promote elements of the sociotechnical systems of work
design (for example, semi-autonomous work groups) because it has proven most successful in improving organizational effectiveness while attending to human values.

Companies today must be adaptable to continuous change to survive (Senge, 1994; Tapscott, 1996). Many organizational change initiatives fail because of management’s concentration on the structural and technological components of the change and disregard of the human side or personal reorientation associated with the change (Demers et al., 1996). Sociotechnical systems design stresses “joint optimization” of the relationships or requirements of both the social and technical elements of the workplace. The workplace must be redesigned or restructured to optimize the fit between people and the mechanics of their work. Traditional approaches often ignore the social needs of the people who do the work. Psychological approaches often ignore the operation of the technical system when work is designed. Changes undertaken from a sociotechnical perspective “involve simultaneous modification of technical and social systems to create designs for work that can lead both to greater task productivity and to increased fulfillment for organization members” (Hackman & Oldham, 1980, authors’ italics, p. 63). In order to compete in a constantly fluctuating environment, companies must realize that the productivity and satisfaction of their employees are key to their survival.

Contrary to sociotechnical systems design theory, many mechanistic and bureaucratic principles of organizations are still firmly entrenched in the western world. Organizational structures continue to be designed to operate through patterns of authority. In discussing organizations, Morgan (1986) states:
By giving detailed attention to patterns of authority, and to the general process of direction, discipline, and subordination of individual to general interest, the classical theorists sought to ensure that when commands were issued from the top of the organization they would travel throughout the organization in a precisely determined way, to create a precisely determined effect (p. 27).

Since Frederick Taylor's rational scientific management theory in 1911, the dominant view has been that hierarchy is an unquestioned structural characteristic of organizations. It is commonly believed that hierarchy or bureaucracy is necessary to achieve organizational goals. Max Weber's definition of hierarchy states that each lower office is controlled and supervised by a higher one. Weber was concerned with bureaucracy as a tool for rationality, precision, reliability and efficiency. In the view of some, he did not emphasize the irrationalities or hidden costs of bureaucracies (Waldo, 1996). Argyris (Quick, 1991) contends that modern organizations continue to impose these formalized structures, rigid channels of communication, hierarchical authority and prescriptive job descriptions, causing alienation, apathy and antagonism in the workers. Blackler and Brown (1985) suggest that "An "innovation approach" to the diffusion of technology predominates, linked to a unitary concept of organization" and "an antagonistic view of participation and efficiency" (p. 213, authors' quotation marks).

Hierarchy includes a scalar chain of command (pyramidal structure of control relationships) and the horizontal division of labour into departments of specialization. Hierarchy is sometimes defined as a centralized communication system. That is, the flow of information up and down the vertical structure forms the relationships of power, privilege and authority. Typically, those who possess information also possess power. It is often the deprivation of information that keeps people at the bottom of the pyramid in
positions of subordination. The relationship between information and hierarchy is interesting. According to Blau and Scott (cited in Iannello, 1992, p. 11):

If there is little information to be transmitted within an organization, there may be no particular advantages to hierarchy and some clear disadvantages, such as the costs of administrative overhead. As the volume of information increases, however, hierarchies can offer benefit in reducing transmission costs and ensuring coordination - up to a certain point. If the volume of information grows excessive, hierarchies become overloaded, and resources at the lowest levels of the organization are underutilized.

Organizational structure affects how information is gathered, processed and communicated. Hierarchical structures remain popular in some organizations precisely because of their ability to sustain close control over information, knowledge and decision-making. Considering the factor of communication within a centralized hierarchical structure, how does decision-making authority get pushed downward or decentralized?

2.3 Organizational Learning

In the past two decades, organizational theorists have focused on the need for organizational learning (Senge, 1990; Schein, 1989; Argyris, 1982). They propose “that it is not enough for leaders to design appropriate organization structures and continue to make well-reasoned decisions; instead, organizations must be characterized at all levels by attentiveness to changing conditions” (Edmondson, 1996, p. 571). The enormous potential of new information technology has a large impact on people and their ability to work and learn. Using information technology in an optimal way (for example, accessing all the information required to make informed decisions on the job through an on-line centralized database) increases the social and organizational capacity within the system. The increasing complexity of the workplace makes top-down control very difficult and
fails to capitalize on the ability of the organization and individuals to learn, adapt and change.

Traditional forms of organizational structures are no longer functional. Sociotechnical tenets state that well designed and fully trained teams that are kept informed are capable of responsible self-direction and decision-making. With the introduction of “quality of work-life” programs, “total quality management” and “continuous process improvement” there is evidence of some support in today’s workplace for project oriented work teams that are responsible and accountable for completing the job from start to finish, including quality control and decision-making. Beatty and Lee (1992) argue that the introduction of information technology reduces the number of people to be supervised but those remaining are better qualified. They further suggest that with information technology managers shift from a direct control approach to one which encourages autonomy within a participative management style.

2.4 Decision-Making in the Workplace

A fundamental element of any organization is the system of decision-making. When an organization is faced with complex or ambiguous problems (as most are today), all members need to be engaged in creative problem solving and the selection of solutions. Pressures towards making organizations more participative in their decision-making processes are strong. As employees have become more educated, more affluent and more clear about their expectations of work, resistance to traditional management structures have increased. Society’s emphasis on democracy and individual rights has
heightened the demand for personal satisfaction on the job and opportunities to influence strategic direction and decisions.

Social scientists have been researching the importance of employee satisfaction and participation in relation to organizational effectiveness for many years. Management literature has argued for better treatment of employees, more interesting work and more democratic supervision for several decades (Argyris, 1973; Likert, 1961; McGregor, 1960). Over thirty years ago the research of Kurt Lewin showed a direct relationship between production and employee participation in decision-making (Lewin, 1951). Similarly, Likert's research demonstrated that higher productivity results from participative management structures rather than hierarchical management structures (Quick, 1991). Both Du Pont and General Motors found that communication and joint problem-solving between the supervisor and the supervised increased productivity and reduced the need for several levels of direct supervisors. Between 1990 and 1994 Dupont reduced the number of management positions by twenty-three per cent because they determined that the traditional, hierarchical command and control structure added time and cost to the process without finding solutions since the managers were furthest removed from the problems being worked on (Moad, 1995, p. 46). "Honeywell, Xerox, Motorola, Ford, General Motors (GM), and Westinghouse have all publicly committed themselves to using a more participative approach to organizing and managing people" (Lawler, 1986, p. 2).

Several researchers have identified organizational decision-making along a continuum from lower level operational decisions through to senior level strategic decisions (Bacharach, Bamberger & Mundell 1995; Gore & Dyson, 1964; Anthony, 1978;
Chia, 1995). In traditional management structures those employees in subordinate positions are not expected to participate in decisions that determine organizational objectives or policies. Chia (1995) suggests that in a highly decentralized work environment it is more productive if the subordinate does not have to refer decisions to his or her immediate superior. Chai circulated a questionnaire to a random selection of companies to research the relationship between information asymmetry, decentralization and job satisfaction. (Information asymmetry is defined as the extent to which the subordinates have more information relating to their own jobs than their immediate supervisors. Decentralization is defined as the level of autonomy in decision-making that is delegated to lower levels in the hierarchy.) In researching 100 companies, Chai found a positive relationship between these three variables and concluded that it is to the organization’s advantage to devolve the decision-making authority to lower level managers who possess more information, particularly in unstable environments. Having the authority to make decisions enables a lower level manager to respond more quickly to a problem because he/she possesses the “local” information required to best inform the decision and to effectively resolve it. Chai found that autonomy also led to increased job satisfaction on the part of the lower level managers.

Studies support the idea that increasing worker control over decisions about their job increases job satisfaction (Jaques, 1951; Herzberg et al., 1959; McGregor, 1960; Vroom, 1967). In a definition of participation, McGregor says that it “consists basically in creating opportunities under suitable conditions for people to influence decisions affecting them. That influence can vary from a little to a lot...participation is a special case of delegation in which the subordinate gains greater control, greater freedom of
choice, with respect to his own responsibilities" (cited in Pateman, 1970, p. 67). Research into employee participation is extensive. Empirical evidence provides some support for the efficacy of participatory management. Theorists from the human relations school of management propose that participatory management leads to meeting higher order needs such as respect, dignity, independence and equality through affective mechanisms. From the self-actualization work of Maslow (1968), Herzberg’s Hygiene-Motivation Theory (1959), the bureaucracy versus democracy studies of Bennis (1966), Argyris’s authentic relationships (1964), McGregor’s Theory Y (1963) and Likert’s System 4 Participative Group (1967) it is generally accepted that employees want and get satisfaction from greater involvement in decisions considered relevant to their own work activities. Participatory management practice makes some basic assumptions. It assumes 1) people want to do a good job, 2) each person knows best how to do his/her job, and 3) individuals must have the opportunity to participate in decisions that affect their jobs to build a commitment for action. Human relations theorists propose that the motivation of workers is closely tied to the ability to have a direct influence on results.

Lewin (1951) determined that people are most likely to carry out decisions when they participate in the problem analysis and solution in making those decisions. Weisbord suggests “both increased influence at the top and more control of the work itself are the signposts for change in productive workplaces” (1988, p.97). Anthony (1978) defines participatory management as:

- the process of involving subordinates in the decision-making process. It stresses active involvement of the people. It uses their expertise and creativity in solving important managerial problems. It rests on the concept of shared authority which holds that managers share their managerial authority with their subordinates.
Finally, it attempts to actually involve subordinates in the important decision processes of the organization, not just in tangential problems or concerns (authors' italics, p. 3).

Pateman (1970) defines participation as “a process in which two or more parties influence each other in making plans, policies or decisions. It is restricted to decisions that have future effects on all those making the decision and on those represented by them...” (p. 67). Involvement and influence can be seen as existing on a continuum. At one end there is management with total responsibility for decision-making and non-managerial employees doing what they are told to do, and at the other end there is non-managerial employees making all final decisions. Participation assumes that employees are responsible, mature adults with competence and the ability to contribute significantly to the organization. For the purposes of this study, the consideration of participation was defined in terms of the manner in which employees influence decision-making both individually in their own job and within the company as a whole.

Organizations make a wide range of decisions in areas ranging from strategic direction and finance to day-to-day operations. In discussing participative workplaces, it is important to discuss what kind of decisions are to be made by lower level employees. A number of studies have shown that individuals have a desire to influence decisions about their own job. Decisions concerning how the job should be done are best made by the person doing the job as he or she has the information and knowledge required to make the decision. In a study in a large food manufacturing enterprise, Hespe and Wall (1976) found that employees wanted to be able to influence decisions at all levels of the organization, although they thought it should be greatest at the local level, next highest at middle management, and least at top management. In a study of 2400 people (Lawler,
1991) it was found that workers want a strong influence on how they do their job and in scheduling their own work. The researchers concluded that a more educated workforce is less willing to take orders simply because they are given by someone in authority.

Lindzey and Aronsen (1969) suggest specific types of outcomes affected by participation in decision-making. One is the quality of the decision reached. An autocratic manager may choose a different course of action from one which results from consulting with his/her subordinates. The autocratic decision-making process does not involve any interaction or communication among people prior to the decision being made. Under certain conditions the mean quality of decisions reached by groups of people exceeds the mean quality of decisions reached by an individual ("two heads are better than one"). Since quality is based on organizational outcomes after the decision is implemented, the amount of information and ability to process information is critical. If the individual manager has all of the information, sharing the decision with subordinates is illogical. However, if information is widely dispersed, then participation by subordinates will lead to high quality decisions. The participatory workplace must actively establish mechanisms to keep all employees provided with the amount of information they feel they need to make adequate decisions (Bernstein, 1982).

Another outcome discussed by Lindzey and Aronsen is the speed and efficiency in which a decision is executed. It may be a very high quality decision, however, it will be totally ineffective if it is not implemented in the organization. Empirical research has demonstrated that participating in a decision increases the probability that the decision will be carried out. A famous experiment by Coch and French in 1948 (cited in Bartlem & Locke, 1981) in the Harwood Manufacturing Company compared four groups of workers.
The one control group was told of the decision for a change in the company and told to implement it, the three experimental groups were given various methods of participation in influencing the decision for an organizational change. The most favourable results (with performance 14% above the pre-change levels) were achieved in the two experimental groups whose members had participated fully in making decisions about the change.

Lawler (1986) describes the four elements of participation in an organization as power (decision-making), information, knowledge and rewards. Power discusses the method of decision-making and authority delegation in the organization from being highly participative to totally top-down. Considerable information must move upward and downward in the organization in order for employees to make effective decisions. Both the kinds of information and the access to information are very important. Covey (1990) suggests “When you share raw, unfiltered data, trust goes up and people move fast. There is no dependence” (p.28). Lawlor goes on to say that any organizational effort to involve employees in participating in important decisions is based on the third element: the knowledge and expertise of the staff. To participate fully, employees must have the technical knowledge to provide solutions to the issues and problems presented, and they must have the people skills to share the expertise. Finally, the fourth element, rewards are both intrinsic and extrinsic. Intrinsic rewards can be increased as a result of individuals being involved in important work decisions. Intrinsic motivation is high if people have interesting jobs and participate in decisions about both how to perform the job and what performance goals will be met.
2.5 Communication Processes

Theorists from the human relations school of management have empirically researched cognitive models of participative effects. Cognitive models consider information to be critical to decision making. Theorists (Anthony, 1978; Frost, Wakely, & Ruh, 1974) suggest that employees have more direct knowledge of their own work than management, and productivity will be strongest for decisions that utilize the expertise of the individual. Cognitive models of participation also propose that if employees have access to relevant information and actively participate in decision-making, they will know more about implementing the decision they helped make.

Information itself is objective, logical and specific. Communication is a process; it is subjective, perceptual and contextual rather than specific. Communication is intended to achieve mutual understanding in the minds of the sender and the receiver of the message (Sutermeister, 1976). Communication includes the source, the message, the channel, the receiver and feedback necessary for the exchange of information. At another level, communication is the intelligence seeking or filtering of the information to be used in making decisions (Goldhaber et al., 1979). Who does what with what pieces of enterprise-related information essentially describes how an organization operates. Thayer (1968) states, "It is the communication that occurs and the patterns of inter-communication which ensue that define and determine the structure and functioning of any organization" (p. 18).

Evident in the previous sections is the key importance of knowledge and information as sources of power in an organization. Controlling the flow of information and the
knowledge that is made available to different people influences whatever decisions are made. Many aspects of organizational structure (for example, number of levels of hierarchy and number of departments) directs information flow and knowledge acquisition. Large organizations are networks of decision units with different information requirements.

There are three basic attributes in the information communicated for decision making: content, reliability, and availability (Alexis & Wilson, 1967). Content refers to the relevance of the information to the decision situation and the extent to which it supplements the prior knowledge of the decision maker. Reliability is a function of the way information is transformed as it moves through various decision units prior to its application. One factor affecting reliability is the perception of the communicators; individuals often perceive information according to their own needs and goals. Availability is primarily determined by the communication structure.

Tiessen and Waterhouse (1983) discuss how the location of information affects the organizational structure. In a stable, routine environment the supervisor and the supervised usually share the same perceptions of future events. Information may exist in standard operating manuals. However, in high uncertainty environments, the supervisor and the supervised will not have the same perception of the future and the necessary information for making decisions is often localized with the worker who is closest to the problem. A decentralized structure is best when there is a high degree of uncertainty or change in the environment.

Classical organizational structure assumes each supervisor should have relatively few subordinates which allows for close supervision. This produces many layers between
the president or chief executive officer and the employees. In a centralized organizational structure decisions are made within a small top level elite group. In a non-traditional, decentralized organizational structure all types of decisions are made at all levels of responsibility in the organization. Some writers strongly suggest a flat, decentralized organizational structure because it gives subordinates more freedom and autonomy (Worthy, 1950; Porter & Lawler, 1964; Ghiselli & Johnson, 1970). Hierarchy and departmental divisions influence how information flows and may be used by people at different levels to “gatekeep” or filter information (Morgan, 1986). Research suggests that one of the most serious information problems is lack of information flow through the communication networks. Alexis and Wilson (1967) discuss “directional bias” wherein autocratic supervisors send information downwards through the hierarchy but information rarely flows upwards. Employee participation in decision-making becomes impractical without considerable information moving downwards to lower levels.

One consequence of computer technology is structural change in organizations. Martin (1996) states, “1980’s-style hierarchies are antique in a world in which a designer in Tokyo can instantaneously interact with a designer in London. New technologies constantly demand new teams, new skills and new job descriptions” (p. 60). Because the transmission of information is very fast and inexpensive, centralization of decisions and communication becomes counter-productive. There is no longer a problem in providing abundant information to the periphery of the organization. It is now possible to provide everyone with a total picture of the organization as well as local information at the same time. In many large, complex corporations senior executives simply cannot manage or be expert in all of the activities the company is involved in, and therefore cannot make the
best decisions in a centralized environment. Information technology promotes the
decentralization of information. Information technology can facilitate the quality of
working life programs which emphasize the decentralization of control and decision-
making to lower levels (Chen & Regan, 1985). However, centralization or
decentralization still depends on the political will of top management and the managerial
choices about the organization of work. Some companies profess to have a decentralized
philosophy but use the large quantity of information available through centralized
databases to continue to make highly centralized decisions or to enforce standardized
operating procedures (greater indirect control). In case studies of six different companies
in Scotland that introduced technology, Buchanan and Boddy (1983) concluded that
technology “creates opportunities for improving the quality of working life, but this
depends on managerial choices about the organization of work” (p. 7). A study by
Tsaklanguanos and Milutinovich (cited in Riley, 1981) found a positive relationship
between decentralization and computer use. They concluded that information technology
supported decentralization by providing better information to lower level employees
which enabled better decision-making.

Problems may also arise in corporations because the information that is made
available is not relevant, although it may be communicated well. In decision-making the
message, report, or data must be related to the context of the decision situation
(Bernstein, 1982). Jackson (1959) notes that employees communicate to accomplish some
goal, satisfy a personal need, or to improve their immediate circumstances. To
communicate upwards requires a climate of trust. Research indicates that within
hierarchical, positional superior-subordinate relationships, subordinates will forward
information that they think the superior wants to hear or that reflects favourably on themselves (Pace, 1983). To develop an atmosphere of trust the workplace must actively establish mechanisms to keep all workers informed and to assist them in their utilization and comprehension of the available information.

Today we see the continuing expansion of high capacity communications and networks for the exchange of information between computers and the increased storage capacity and processing power of centralized data banks. Workers can access information and communication facilities from anywhere and anytime. This entails a fundamental change in the nature of work and in uses of information and communications, as it is the people in the organization that convert the information into usable knowledge. With information technology, the very structure and form of organizations are subject to change. Diebold (1970) suggests that operational dividing lines are bypassed or eliminated because new technologies demonstrate that the division of labour and separation of functions actually impede productivity. Senior management has access to data bases without middle managers’ intervention and analysis, and conversely, upper management decisions can be communicated throughout the organization without going through the traditional hierarchical management chain. Computers organize and process information so quickly that information technology enables top management to know everything that happens as soon as it happens even in large and dispersed organizations (Tsaklanganos & Milutinovich, cited in Riley, 1981). In fact, Goldhaber et al. (1979) propose that those interpreting the environment at the local level - the front-line staff - are actually controlling the organization! They base this on the
assumption that those who are in possession of and utilize the information which bears upon decisions are the source of organizational power.

Successful companies have lateral (horizontal) lines of communication rather than vertical, hierarchical channels. Information is shared among peers located at the same authority level of the organization. Horizontal communication is often used to coordinate work, share information on plans and to solve problems. Workers have the information they need to do the job well and to be creative in generating new ideas or techniques (Spencer, 1989). According to Likert (1967), an ideal organization operates as a “System IV - Participative System” where information flows in all directions with control exercised at all levels. In this model, people communicate openly and freely. Likert’s research indicates that this is preferred by most organizations but unfortunately, rarely achieved. In the research conducted twelve years later, Golhaber et al. (1979) reported that we were experiencing an “organizational revolution” in which decision-making power was rapidly shifting from the traditional positional decision makers to the knowledge workers (staff). Filtering all of the information received and interpreting it to make decisions utilizes the human resources throughout the organization and people become “knowledge workers”.

The trend is clear, more and more of the energies of organizations are devoted to communication activities. The actual communication system within an organization is becoming an increasingly powerful determinant of its overall effectiveness. If we accept the predictions of Toffler (1970) and the writing of current management theorists (Senge, 1994; Drucker, 1988; Tapscott, 1996) organizations will be built on continually changing
structures with transitory human relationships and therefore, the ability to establish efficient organizational communication systems for good decision-making is crucial.

2.6 Work Redesign

In organizational psychology literature, the employee's feelings of personal control (perceived control) can be found in two areas of research; participative decision-making and job redesign. In this section the elements of work redesign including job enrichment, job autonomy and information technology in the workplace will be discussed.

The central tenet of job redesign is “to take human skills, abilities and motivation into account in allocating tasks and organizing work” (Buchanan & Boddy, 1983, p. 27). Job redesign literature describes a variety of methods for jobs to be changed in order to enhance productivity and job satisfaction. Job redesign is defined as “activities that involve the modernization of specific jobs with the intent of increasing both the quality of the employee's work experience and their performance” (Hoy & Miskel, 1987, p. 199). When new technology is introduced, specific job functions and work flow change and therefore, skill level and performance expectations of employees also change. Most work redesign projects provide employees with increased opportunities for job autonomy and self-direction. Sociotechnical systems design theory emphasizes the “joint optimization” of both the social and technical aspects within a work system. The aim of redesigning the workplace is to achieve this “optimal fit” which results in greater productivity and increased job satisfaction (Davis & Chems, 1975).
The whole concept of finding methods for making work more interesting was originally developed by Herzberg (1966) who coined the idea "job enlargement" which later became termed "job enrichment" or "job expansion". It is possible to horizontally expand a job and/or to vertically expand a job. Horizontal expansion refers to enlarging the job to include all of the tasks to complete the whole product or service. For example, an individual may assemble an entire product like a toaster, or complete all of the paper transactions required from the first customer call to the final shipment. Vertical expansion gives individuals responsibility for tasks that require decision-making. For example, scheduling their work, determining the work methods and doing their own quality control. There are many successful job-enrichment programs cited in the literature. One example is Northwestern Mutual Insurance (Lawler, 1986). Before the work redesign various people on various floors were responsible for different parts of a forty-step process for opening new insurance policies. After the redesign one person did all of the forty steps according to a geographic region.

Technology plays an important role in the nature of the work performed. Changes in technology change the tasks people are expected to perform in their job. It can have an impact on the number of tasks in a job and the complexity of the task. In the case studies Menzies (1984) researched, she found that in the information society the work force was required to apply a more sophisticated range of skills and knowledge. Information technology alone is of no use without the people to provide the flexibility and adaptability to operate it effectively (Buchanan & Boddy, 1983).

Successful organizational changes must start with a design that anticipates and mandates behavioural change in the workers. If greater job autonomy and increased job
satisfaction were desired with the introduction of information technology, then behaviour changes need to be identified that support this objective and the new behaviour should be reinforced by the information technology initiative.

2.7 Job Autonomy

For the purposes of this research, focus is on the job redesign characteristic of job autonomy, "which is the extent to which individual employees can structure and control how and when they do their particular jobs" (Spector, 1986, p. 1006). Chung (1977) defines autonomy as the degree to which a worker may determine his or her own work methods, have control over work schedules and goal setting. Similarly, DeCotiis and Koys (1980) define autonomy as the perception of self-determination in choosing work procedures, goals and priorities. When a job provides significant autonomy, the work outcomes are viewed by the employee as a result of his or her own efforts, initiatives and decisions, rather than of an outside influence (like a supervisor). Job autonomy is considered the primary job characteristic that creates a feeling of responsibility for the worker.

Technology can determine the amount of control the worker has over the pace of work, decision making, or other related processes (Ermann, Williams, & Gutierrez, 1990). Ramo (1983) proposes that information technology increases productivity and moves people from manual tasks to positions where they direct and utilize the information system to meet their own needs. For example, rather than executing a small number of steps repeatedly for many transactions, one person may perform all aspects of a job for a smaller number of customers using one centralized database of information.
Individuals may also complete tasks jointly with others at the same or geographically dispersed locations, in real time or asynchronously, or have online discussions both within and outside the organization (Chandler-Chrichlow, 1995).

One of the most renowned works in this field is the job characteristics model developed by Hackman and Oldham (1976) which describes five core job dimensions including job autonomy. Hackman and Oldham (1980, p. 79) define autonomy as “the degree to which the job provides substantial freedom, independence, and discretion to the individual in scheduling the work and in determining the procedures to be used in carrying it out”. In the Hackman and Oldham model, the core job characteristic of autonomy leads to the critical psychological state of “perceived experience in responsibility for the outcomes of the work”. Hackman and Oldham focus on employee perceptions of the job because they state that regardless of the amount of job autonomy a worker has in his or her work, “it is how much he perceives that he has which affects his reactions to the job” (Breaugh, 1985, p. 557).

Information technology (IT) offers important opportunities for decentralizing information so that employees may make more decisions about how and when they do their own jobs. According to Thach and Woodman (1994):

In the eyes of many managers, this equates to changing the locus of power. If implemented in its most productive fashion, information technology provides line employees with the data to perform their jobs more effectively and make decisions on job changes (p. 31).

Participation in the workplace is often defined as the amount of involvement employees have in decision-making. There have been several studies that have found participative decision-making and job autonomy are linked to the employee’s perceived
control in the workplace. Spector (1986) conducted a meta-analysis of 101 samples taken from eighty-eight studies that included either measures of job autonomy or measures of participative decision-making. He found that for all of the studies combined, high levels of perceived control were associated with high levels of job satisfaction. This was also found in analyzing the autonomy and participation studies separately. Similarly, Spector (1986, p.1015) found “that increasing control for employees, to the extent that it impacts perceived control, would lead to greater satisfaction, commitment, involvement, motivation, and performance, and lower physical and emotional distress, role stress, and withdrawal”. Evans and Fischer (1992) conducted a study surveying 228 employees of a private computer company and 361 employees of a public school board to determine the antecedents of organizational stress and burnout. The study included four scales related to perceived control in the workplace. The results indicated that the degree of discretion or choice that individuals have regarding the methods they utilize in doing their work gives the employees the perception of control in the workplace, which is associated with a number of positive consequences including increased satisfaction and decreased stress. Richard Long (1993) used the Hackman and Oldham Job Diagnostic Survey to examine job quality after the introduction of new information technology. Long collected data from 114 Canadian companies involved in the primary, manufacturing and service sectors. Results indicated that computerization improved the job quality for seventy percent of the respondents. Long concluded that information technology has the potential to positively affect job quality by providing feedback on the results of one’s work and by making it possible to increase the amount of job autonomy enjoyed by employees. Graham Lowe (1991) examined the introduction of computers on the Canadian labour
force during 1984 to 1989 using the General Social Survey (GSS). One third of the labour force, 4.3 million people, used personal computers on the job. Through the self-reported evaluations, he found that employees using computers perceived that they had better jobs. “Specifically, greater proportions of computer users agreed strongly or somewhat that their positions required a high level of skill, provided a lot of decision-making freedom, paid well, and offered good promotion or career prospects” (p. 43).

2.8 Information Technology in Organizations

Organizations are formed any time two or more people are required to share time, space, goods or services (Phillips, 1982). “Organizations are comprised of parts which communicate with each other, receive messages from the outside world, and store information” (Scott, 1961, p. 18, cited in Pace, 1983). Martin (1996) describes a modern organization “rather like a biological organism, except that it consists of people and electronics, organized to achieve certain goals. It has a nervous system that extends to every employee’s desk” (p. 61). When people organize themselves, the flow of enterprise-related information in and out of decision points and the strategic relationships between and among the working parts forms the basis of the organization. “Communication processes are thus the crucial processes which both enable and determine the conditions, the operations, and the interrelationships” (Thayer, 1968, p. 18). Essentially, communication is the organization.

For the purposes of this research, information technology (IT) was defined as computer based communication systems (electronic mail, executive information systems, distributed databases, computer mediated conferences, computer supported collaborative
work, universal file sharing, electronic bulletin boards and electronic information exchange through the use of computers, modems, cables and computer networks).

Information technology is more than an electronic tool for communication (to send and receive messages). Client-server technology allows networks of users to be linked to a common “file cabinet” for information sharing and collaborative group work. Computers are used for gathering, storing, manipulating and communicating information. They are programmed to reduce, analyze, synthesize, reorganize and display or print-out patterns of data that may not otherwise be available or may require considerably more time to process (Thayer, 1968). Information is electronically created, stored and used. This involves the concept of integrated management information and intelligence systems in which a central computer processor participates actively in the day-to-day management of the company (Diebold, 1970).

Organizations are bombarded with information and data both internally and externally. Computers are used to collect and manipulate millions of pieces of data. What is needed is the ability to make sense of the information. To say that computers were initially introduced to do the same things faster does not make them different from any other technical tool. Weizenbaum (1976) suggests that “The arrival ... of the electronic computer has changed our image of the machine from that of a transducer and transmitter of power to that of a transformer of information (p. 41). Information processing can interpret information in meaningful ways to solve problems. Potts (1989) suggests that this requires dialogue, which then “makes knowledge”. “Knowledge is what gives organizations the ability to perform high-quality problem solving, make good decision
Computer networks enable dialogues to occur among those having relevant points of view and transform information into a knowledge base” (p. 257).

Tapscott (1996) proposes that the new economy is a knowledge economy. Added value is created by brain, not brawn. He claims that almost 60% of American workers are knowledge workers and eight of ten new jobs are in information-intensive sectors of the economy (p.7). Menzies (1982) suggests that employment in the new “information economy” will come from applying information in making judgments or decisions. “In other words, the information society will employ creative knowledge workers, rather than information workers” (p. 90). Knowledge is the primary source of a competitive edge.

The corporation needs a knowledge infrastructure “to capture and create knowledge, store it, improve it, clarify it, disseminate it to all employees, and put it to use...the modern corporation should enhance the knowledge of all workers and support them with software that encapsulates knowledge” (Martin, 1996, p. 64). David Shpilberg, a partner in the global management-consulting firm of Ernst & Young, observed, “We’re moving to an organization where knowledge becomes the key driver and the sharing of knowledge is formalized...The hierarchy becomes less clear and less important, because it is more event-driven” (LaBarre, 1995, p. 31). The tool for sharing knowledge within the organization is information technology.

“An era in which the new resource is knowledge is startlingly different from an era in which the key resources were capital, raw materials, land, and labor” (Martin, 1996, p. 64). New technology inevitably affects such aspects of organizations as the style of management, structure, performance expectations and relations among employees. Computers allow organizations to see that the management of information is central to
supporting their operations. Companies will not be competitive if they do not make use of information that is probed, processed, analyzed and updated (Ramo, 1983). The technology processes data into information. Thayer (1968) states, “Information, not data, is the raw material for thinking, decisioning, problem-solving, attitude development, learning, and all of the specifically human activities that concern us” (p. 29).

The use of information technology in computer networks supplements face-to-face and telephone meetings by offering specific advantages. For example, people may communicate “asynchronously”, that is people may leave or respond to messages whenever it is convenient through the use of electronic mail. Through computer mediated communication, more people may participate in the discussion and news can be disseminated quickly throughout the organization. In this way greater knowledge can be generated and more appropriate decisions made (Potts, 1989). If information technology is properly employed it may enable organizations to better capitalize on human resources for those tasks that require judgment and rapid communication, as well as promote faster, better decision-making.

There are both exciting prospects and new perils to the emerging information society. As information industries grow, problems associated with information will also grow. According to Ramo (1983), in 1982 the number of computers in the world exceeded five billion, more than the earth’s total population (p.119). Weizenbaum (1976) cautions that once information technology is thoroughly integrated into our complex societal structures, it may constitute an irreversible commitment. The new information technology can keep detailed track of both organization and personal information beyond anything we could have visualized before. As more and more business, working, learning
and playing transactions occur between networks of computers, unimaginable quantities
and types of information become available far and wide (Ramo, 1983; Tapscott, 1996).
Tapscott discusses the potential for “severe social stratification, unprecedented invasion
of privacy and other rights, structural unemployment, and massive social dislocation and
conflict” (p. 2). Ramo (1983) observes that there is also general apprehension of a
computerized society “because we fear it may lead to domination of our lives by
computers programmed to schedule all production and distribution with little human
selection and initiative” (p. 9). As more and more transactions become electronic there is
the potential for workers to become isolated, depersonalized and alienated.

There are conflicting studies on the impact of technology on the workplace
environment. Some of the early work by Blauner (1964) examined sociotechnical
characteristics in four industries (printing, textiles, automobile manufacturing and
chemicals processing). He found workers were most alienated in industries using mass
production technology and least alienated in automated industries. He defined alienation
as feelings of powerlessness (lack of control of job activities) and meaninglessness (only
contribute to part of the total output). However, the idea that computer technology always
reduces worker alienation is challenged by more recent studies. Heather Menzies (1984),
a Canadian researcher, has conducted lengthy research on the impact of information
technology on employment, particularly that of women. She has found that information
technology disproportionately reduces the labour content of low-skilled, highly
standardized, single function or clerical information occupations. In addition to the
elimination of jobs, she also found the skill content of existing jobs to be changed
(deskilling employees). One of the effects of the new technology is to enable the company
to increase its business without a proportionate increase in either clerical or professional personnel. Menzies calls this "jobless economic growth" (p. 38) where there is employment stagnation but increasing output. Women are particularly affected because they are concentrated in service and clerical type occupations (which account for over 90% of female employment). With the assistance of computer technology, professionals are expanding their positions to include many of the clerical functions that were originally performed by another. Menzies (1982) also proposes that the skills and knowledge of middle managers are being subtly downgraded as well because many of the functions of supervisory work are also becoming automated processes (p. 34). In a study on the effects of electronic data processing (cited in Buchanan & Boddy, 1983), the authors concluded that the new system eliminated routine clerical tasks and also introduced feelings of loss of autonomy because the variations in work rate and tolerance for errors was reduced.

Another risk affiliated with the incredible amounts of information available through information technology is the power it accords the top executives. Companies will find it possible to centralize and process information in such a way that decentralized responsibilities would actually be withdrawn (Vardaman & Halterman, 1968). There is also the potential to measure the performance of every unit of service and closely monitor individual people worldwide, at any time of the day or night. In an interview conducted with Edgar Schein, a professor at MIT who has researched many organizations over the past several years, Schein describes experiences where the employees have resented being monitored so closely and therefore began to provide bad or erroneous information, successfully subverting the whole information management system (Schein, 1989).
It is already evident that change causes dislocation. The displaced workers in the manufacturing sector are often unable to get a job in a new type of work that requires a different knowledge base. The nature of work and the requirements of the workforce are fundamentally different in the information economy. There is little job mobility between the industrial production of goods economy and the new knowledge-based industries (Tapscott, 1996). Warren Bennis, a leader in organizational development, sees the recent radical downsizing and restructuring activities of corporations as being on a direct collision course with the ideas of employee empowerment and decision-making (Hodgetts, 1996). In the past, people who were laid off during economic downturns would soon find new positions in another company. Through the use of information technology, companies today are downsizing permanently and positions no longer exist. Corporations are choosing not to use information technology to augment and expand what people do, but to replace and diminish their jobs (Menzies, 1996).

Information technology also brings new forms of job stress. With “virtual offices” (work anywhere, anytime), instant access, immediate response capabilities, constantly shifting environments, and endless communication by e-mail, voice-mail, newsgroups, facsimile and even paper, there is the distinct problem of technology exhaustion. Computerized filing and software programs have removed the simple tasks where people normally paced themselves with some “slack” time; instead people are always working at a frenetic pace. Constant change also doesn’t allow people to get very comfortable or familiar with a new technology before yet another new program is introduced. The concerns about information overload and living with constant change are viable issues that require new skills to address them.
There is an unrealistic expectation that having access to all of this information through electronic discussions somehow improves communication. However, changing how information is shared does not change the behaviour of the communicator. The technology allows people to communicate further, faster and more often but the person sending the message must still be clear, direct and focused (Sheridan, 1995). Similarly, restrictive codes and passwords may actually isolate or segment information so that employees are “locked out” of access to vital information. This can actually limit job autonomy and reduce the opportunities for decision-making in the workplace. Qualitatively high participation in the organization’s decision-making process is predicated upon high information accessibility (Goldhaber et al., 1979).

Throughout the 1970’s and early 1980’s, considerable controversy has evolved about the negative impact of information technology on work and people within organizations. The introduction of information technology has been seen as alienating, socially isolating and bringing less meaning or even displacing jobs. What is interesting, though, is that researchers in the late 1980’s and 1990’s have found just the opposite. For those people who have upgraded their skills and remained within the organization, they have found their jobs more interesting, more satisfying, and more rewarding (Menzies, 1984; Long, 1993, Lowe, 1991).

The information technology revolution also confronts us with unprecedented opportunities. As more middle managers work with computer programs and automated reporting, there is less need for strict hierarchies and a more open management style becomes possible. More self-management and alternative working arrangements are made viable, which improves the quality of working life (Menzies, 1982). For those people
who are not displaced or dislocated, remaining jobs are enriched. Computers expand the scope and standards of the job and offer the opportunity for more creative, interesting and high-skilled work that involves employees in exercising control, judgment and decision-making. As repetitive jobs and functions are automated, a range of new experiences provides the potential for more satisfying and interesting work and new career paths. According to a report from Industry Canada (March, 1996) new technologies have created new businesses and new jobs. The Canadian government has made a commitment to funding technology as it is considered fundamental to increased economic growth and sustained job creation. Knowledge and information are considered the root of the Canadian economy.

Information technology has the power and capacity to open up communication within an organization. This may be through horizontal team processes (unlimited by geography or time) or vertically throughout the structure. The technology facilitates decentralization of the organizational structure because the provision of information is much easier (Chen & Regan, 1985). This enables information sharing and joint decision-making; in other words, a participatory work environment is facilitated. George Bailey of Price Waterhouse believes:

There is going to be a tremendous shift during the next 25 years toward independence, autonomy, and self-directedness with people and teams accountable for their own performance...I don’t think companies will be able to compete without redefining the way that work is done and how organizations are managed (cited in Verespej, 1995, p. 25).

2.9 Summary
Organizational structures and beliefs have been shaped by the Industrial Age. Many businesses simply use information technology to do faster what they have done.
before; for example, they issue reports, forecast trends, analyze financial statements or keep track of inventory. In many companies, the management structures have not in fact changed, they have just become electronic. The technology itself largely plays a neutral role; it can support centralization and hierarchical structures, or it can support decentralization and flattened structures. Conversely, the use of information technology can change the ways people communicate and work. The shift to an information-based society is quickly moving employees from performing clerical and manual functions to being knowledge workers who analyze information, make decisions and self-manage. Information networks may allow us “to extend our eyes, ears, voices, and consciousness around the world in a rich ecology of reciprocal interactivity; but only if those extensions are designed and structured to be truly democratic, inclusive, and participatory (Menzies, 1996, p. 12). Thayer (1968) describes computers as tools which can alter for good or ill human “communicate-abilities and -susceptibilities”, depending how they are used in communication systems (p. 264). Utilizing the human resources of all staff to share the information (now easily available through the technology) required to make decisions and plan future direction allows people to participate in the management of the company in full and meaningful employment and brings people into a new postindustrial society.

The research on work redesign about the impact of information technologies on the experience of work appears to be equivocal. On the one hand, as the demands for worker participation and improved quality of work life continue, information technology can provide job enrichment opportunities. On the other hand, as senior management in their traditional role continue to make all of the decisions and control the workers in their tasks, information technology can provide better performance information to these
managers and increased centralized control of the work. This may cause workers to experience loss of autonomy and meaninglessness in their jobs.

2.10 Relationship of the Literature Review to this Case Study

The case study in this research was designed to further explore the impact of technology from the perspective of the employees who had their jobs redesigned. This was achieved through a sociotechnical systems design perspective; studying the organization, the people and the technology. In studying the organization, this research explored the relationship between the organizational structure and processes for information-sharing and decision-making in a national company with decentralized branch offices. It was designed to investigate whether or not information technology moved the organization towards individual self-management in decision-making on the job.

In studying the people, it is suggested in the literature that when individuals participate in decisions about their own performance it can affect their commitment to achieve those goals. People are more likely to be motivated to do their job and to have increased job satisfaction when they are given a say in how to do the work, what methods to use and how to perform their day-to-day work activities. To further explore this area and include the impact of technology on participation in decision-making this research study asked respondents specific questions about their daily work methods, work scheduling and determining performance goals. A primary anticipated outcome of the study reported here was a descriptive analysis of employee perceptions of how the introduction of information technology that they now used on a daily basis had changed
their work and affected their behaviour in communicating, information-sharing and decision-making.

Many of the research studies reviewed in the literature concentrate on the relationship between job satisfaction and increased work productivity. While that is an important area of study, that is not in the area in which I conducted this research. In this research I explored the relationship between increased participation and individual control over decision-making in the job through the use of computer technology.
Chapter 3: Methodology

3.1 Rationale for the Research Approach

There are two basic methodologies for conducting empirical research: quantitative or qualitative. Each approach has its own advantages and disadvantages. Typically, quantitative studies are designed so that the researcher can manipulate the behaviour of the subjects in a direct and systematic manner. Quantitative research is often referred to as "traditional" or "experimental" research. It uses deductive logic to explain and predict behaviour. "Knowledge is derived through objectivity and the absence of the researcher's values (bias) in drawing conclusions. It thus depends heavily upon detachment by the researcher and objective observations" (Yegidis & Weinbach, 1996). Conversely, qualitative research "allows an investigation to retain the holistic and meaningful characteristics of real-life events" (Yin, 1989, p. 14). Qualitative study tries to understand complex social phenomena from the perspective of the individuals actually experiencing the real-life event. It employs terms such as "subjective", "relative" or "contextual" to give meaning to the results. "There is no pretense that the researcher can collect data in an objective, value-free manner...Feelings of trust and equality [between the researcher and participants] in the knowledge-building process are believed to facilitate understanding" (Yegidis & Weinbach, 1996). Qualitative designs are most appropriate for the study of problems where there is limited available knowledge. Qualitative study techniques allow the researcher to share in people's understandings and examine how people learn about and make sense of themselves and others in their daily lives.
This research employs a qualitative research methodology to address the research questions. A qualitative approach was preferred because the research was designed to explore the impact of the introduction of information technology (IT) on decision-making and job autonomy experienced by employees in a company worksite. This research conforms to a common case study design in which a single group is studied only once, subsequent to some agent or treatment presumed to cause the change (Lee, 1989). According to Yin (1989), a case study is an empirical inquiry that is “...the preferred strategy when "how" or "why" questions are being posed, when the investigator has little control over events, and when the focus is on a contemporary phenomenon within some real-life context” (p. 13). In discussing research in organizations, Mowday and Steers (1979) suggest, “One important feature of data obtained from a "real-life" situation is that the humans in that situation are operating under natural "not necessarily stronger" motivational forces, since the phenomena being studied are a part of their actual lives” (authors’ quotations, p. 6). The case study uses an inductive mode of inquiry. The researcher approaches the study with open curiosity and the aim to describe patterns or processes, rather than the intention to prove or disprove an existing hypothesis (Laiken, 1987).

A basic difficulty with social research is that in the real world (as opposed to a laboratory setting) a large number of variables are found to be highly interrelated and their causes and effects are often hard to disentangle (Blalock, 1970). In essence, “life goes on” while the study takes place. The researcher considered a qualitative research approach to be most desirable for the very reason that it is grounded in a real-life situation.
and is focused on seeking a new understanding from the perspective of those living the experience.

3.2 Procedures

3.2.1 Selection of the Research Site

There were two main criteria for selecting the company for this case study:

1. First, a company was sought that had introduced information technology into the workplace within the recent past with employees who had remained in essentially the same job both before and after the introduction of personal computers. The reason for this was to hold the individual employee and the job relatively constant to determine the impact of the technology as the major change factor in the job and to study it recently enough that respondents could remember the way the job was prior to computerization.

2. Second, employees were sought who were expected to personally use information technology to perform at least part of their job responsibilities through a personal computer or designated computer terminal. The reason for this was to make sure the effects of the introduction of technology was felt at the “front-line” level and had a direct impact on the person’s job.

The company that met the above criteria was a private Canadian-owned company that provided a full range of services to facilitate the distribution, transportation and cross-border movement of goods within North America. It cleared an average of 9,000 shipments per day through customs. The company had commissioned an outside consulting firm to completely computerize the salesforce for their customs brokerage
services early in 1995. The introduction of technology was intended to modernize the workforce and increase productivity. A six month pilot team was recruited through the head office branch (Toronto, Ontario) in mid 1995 and full scale restructuring and computerization of all sales personnel across Canada was implemented in January, 1996.

The researcher arranged to meet with the company Manager of Training and Development to outline the purpose of the research and request permission to use this company for the research case study. This Manager agreed to take presentation materials prepared by the researcher to the Senior Management Team and the research site was approved in May, 1997.

3.2.2 Research Design

The research was conducted using a descriptive single-case study design. The goal of the researcher was to collect sufficient data in the described context that the analysis and interpretation of the findings would add to the broad knowledge of organizational management and information technology.

Only by using multiple methodologies can social researchers protect themselves from systematic distortions of the conclusions reached. If the findings obtained from multiple methods are relatively consistent then one can be reasonably sure that the results reflect the phenomena being studied (Hackman & Oldham, 1980). This case study used multiple sources of evidence including a review of organizational documents and training documents used to educate staff to the restructured workplace, hours of observation and informal conversation with employees, semi-standardized interviews with all Business Development Specialists, open-ended interviews with management staff and the
administration of a quantitative measurement tool for job autonomy. "Thus, any finding or conclusion in a case study is likely to be more convincing and accurate if it is based on several different sources of information, following a corroboratory mode" (Yin, 1989, p. 97).

**Interview Process**

The researcher conducted individual semi-standardized face-to-face or telephone interviews with all the sales employees (called "Business Development Specialists") across Canada. According to Berg (1989):

This type of interview involves the implementation of a number of predetermined questions and/or special topics. These questions are typically asked of each interviewee in a systematic and consistent order, but allow the interviewers sufficient freedom to digress; that is, the interviewers are permitted (in fact expected) to probe far beyond the answers to their prepared and standardized questions (p. 17).

Interview questions were designed to use the language of the work culture as much as possible by utilizing company terms for various programs, positions and activities. The researcher made no effort to disguise that the purpose of the questions was to find out how the computer technology had impacted decision-making and job autonomy in the workplace. It was therefore very important to develop a good rapport with each respondent and to assure him or her that the answers would remain anonymous so that the respondent would consider it advantageous to be candid and honest in the responses.

Participation in the study was completely voluntary. Each person was asked to sign an "Agreement to Participate" form (see Appendix A) which advised that he or she could withdraw from the research at anytime. The researcher was able to interview all of
the members of the study group, a one hundred per cent participation rate. The researcher combined responses into aggregate results by geographic boundaries to preserve the confidentiality of individual answers.

Personal face-to-face interviews were held with eighteen of the twenty-four Business Development Specialists located in the province of Ontario (described as Central region in the data) and telephone interviews were held with six people in Ontario plus twenty salespeople from across the country (see Appendix B: Business Development Specialists Interview Questions). The aggregate data for East region included all respondents \((n = 13)\) from the province of Quebec and the cities of Halifax, Nova Scotia, Moncton, New Brunswick, and Ottawa, Ontario. The researcher described West region \((n = 7)\) to include all respondents from Edmonton and Calgary, Alberta and the province of British Columbia. Both face-to-face and telephone interviews were conducted individually at the worksite in a private room. Each interview was structured with identical questions and was approximately one hour in length. The researcher put the answers directly into a computer database during each interview. Respondents were invited to observe what the researcher was recording if they wished.

**Job Diagnostic Survey**

The eighteen people in Ontario who participated in face-to-face interviews also completed written questions pertaining to job autonomy from the *Job Diagnostic Survey (JDS)* (Hackman & Oldham, 1980). The Job Diagnostic Survey (see Appendix C: Part I) is a data collection instrument that is used to evaluate the effects of work redesign. A key element that this survey instrument measures is the effects of workplace changes on employee satisfaction and on the amount of job autonomy they experience. Respondents
indicate their level of agreement with a number of statements about their work experiences and these statements are then scored for an overall measure of personal outcomes a person obtains from performing the job.

The Job Diagnostic Survey is based on the theory that positive personal and work outcomes are maintained when three critical psychological states are present for any given employee; experienced meaningfulness of the work, experienced responsibility for the outcome of the work, and knowledge of the results of the work activities (Hackman & Oldham, 1975). The theory proposes that these three psychological states are created by the presence of five core job dimensions. The second psychological state, “experienced responsibility for the outcome of the work”, is increased when a job has the core dimension of “autonomy”. Autonomy is defined by Hackman and Oldham as “The degree to which the job provides substantial freedom, independence, and discretion to the employee in scheduling the work and in determining the procedures to be used in carrying it out” (1975, p. 162). The JDS has been used extensively in research and change projects over the years and data has been compiled which offers average JDS scores across 876 occupations including normative data (with means and standard deviations) for sales positions. The Job Diagnostic Survey was chosen because it is a well established tool which has been used by several researchers trying to assess the impact of work redesign on the nature of jobs. However, the validity of some of the JDS scales remains unestablished, particularly in the measure of growth need strength (not used in this research). The authors recommend that more than one methodology be used to gather information about people’s jobs and their reactions to them and that the different
measures be checked for consistency before implementing change (Hackman & Oldham, 1980, p. 313).

**Satisfaction Survey**

The eighteen people in Ontario who completed the written Job Diagnostic Survey questions on job autonomy also completed a separate section measuring job satisfaction. The Satisfaction Survey (see Appendix C: Part II) was developed by the researcher to measure feelings of satisfaction in accomplishments and challenges experienced in the job.

**Management Interviews**

After completion of the forty-four interviews with the front-line sales employees the researcher interviewed the three immediate supervisors (one from each region) of the respondent group to correlate their perception of the impact of technology on the people they supervised from the management perspective (see Appendix D: Management Interview Questions). Face-to-face interviews were held with the managers from West region and from Central region and a telephone interview was held with the manager from East region. Their responses are included within the text of the findings, not in the aggregate data.

3.3 Data Analysis

3.3.1 Interviews

The individual responses were recorded verbatim during the interview process without any effort to edit or interpret the information. In the first phase of the qualitative data analysis all of the transcripts were reviewed and examined for emerging themes or
patterns of responses. An open coding procedure was used to allow as many categories as possible to emerge from the raw data. The first coding procedure resulted in thirty-five categories derived from the original research questions. Eventually the categories were reduced into ten themes and finally collapsed under four major headings by joining similar themes.

3.3.2 Job Diagnostic Survey

All questions pertaining to "job autonomy" were selected from the measurement tool developed at Yale University by Richard Hackman and Greg Oldham in 1974. Each question in the survey was recorded and tabulated using the instructions for scoring in the JDS user's guide. The scores of the respondents who worked in the job of Business Development Specialist were averaged for a calculated mean score. This score was compared to the appropriate norm of "Sales" in the Job Diagnostic Survey that was developed through extensive testing of the instrument across several job families.

3.3.3 Satisfaction Survey

Each question in the satisfaction survey was recorded and tabulated. The scores of the respondents were averaged for a calculated mean score on a scale of 1 (extremely dissatisfied) to 7 (extremely satisfied).

3.3.4 Summary of Analysis

To the knowledge of the researcher the company in this case study did not purposely decide to take a sociotechnical systems design approach to the restructuring of the sales group. The researcher chose to analyze the findings and discover emerging
themes in the content using the sociotechnical systems design theory as a foundational concept to underpin the analysis. The findings describe the technical changes and the socio-psychological changes experienced by the respondent group. The responses to the interview questions were finally categorized into the following areas: work redesign, organizational learning, decision-making and job autonomy.

3.4 Limitations to the Study

This research conforms to a common case study design in which a single group is studied only once, subsequent to some treatment presumed to cause a change. While there may be similarities, every workplace is unique. What works (or doesn’t) in one setting will not necessarily be the same in another setting. The case study explores the circumstances that existed in one moment in time. Inferences are based on general expectations of what the data would have been had the change intervention not taken place. Kennedy (1979) states:

Clearly a study of a single case with no replication limits both the strength and the range of generalization arguments considerably. It does not preclude a description of the relevant common and unique attributes of the case. But, in fact, the range of generalization cannot be known to the evaluator (cited in Halpern, 1983).

In this study, a sales group in a customs and brokerage context in a single company is researched. To build a more comprehensive body of knowledge in the field of organizational management and work restructuring there is a need for more case study work across different companies and cross-case analysis of similar variables like decision-making and job autonomy.
Limitations to the Interview Process

It is difficult to obtain data about work and people’s reactions to it that is completely trustworthy. Interviews were conducted in a private room at the worksite during working hours. Although completely confidential, colleagues and management could observe how long interviewees met with the researcher, how anxious or upset they appeared when they began and finished the interview, and what they were willing to discuss with others between interviews. The researcher formally met with each person only once and had to develop a rapport very quickly to solicit honest and accurate results.

The researcher had been on-site in the Toronto branch on several occasions before the announcement of the sale of the company was made. Enough trust had been developed by this time that employees openly asked if the researcher was “a spy” from the new owners.

Limitations of the Researcher

Any observer in an unfamiliar workplace situation is prone to distortion in what she sees and understands. Cultural norms and personal biases are integral to every person’s frame of reference and observations are unavoidably subjective. Every effort was made to keep the researcher’s biases out of the study by structuring interview questions, using a consistent format and approach with each interviewee, keeping her voice neutral and reserving all judgmental comments or reactions to the responses. When respondents expressed concerns, the researcher did not offer any advice or suggestions to resolve problems. In building trust between the researcher and the respondents during the interview, the researcher provided the opportunity for the worker to make open-ended
comments and personal recommendations about their job and she offered to forward those ideas in a final report to the company.

**Limitations to Sociotechnical Systems Design Theory**

According to Hackman and Oldham (1980, p. 65), “There are no theory-specified principles or procedures for carrying out sociotechnical changes in work systems”. Sociotechnical systems theory is very general and very specific at the same time; general in that the tenets of theory are weakly linked with particular actions observed in the workplace, specific in that the description of what happens in the workplace is very detailed.

There are great individual differences in how people respond to changes in their work. Sociotechnical systems design theory does not suggest how these differences should be incorporated into the design of changes in the workplace.

**Limitations to the Job Diagnostic Survey (JDS)**

There are several identified limitations to the JDS instrument and various cautions regarding its use. One limitation is the relative ease with which respondents can deliberately distort their answers in the survey items. Respondents may want to present themselves in a certain way and may not trust that accurate answers will serve their own best interests. The only way to protect against this is to collect other data independent from the survey.

A second limitation is limited validity of some JDS scales. More validity studies are needed in many different research studies to be sure that the survey is measuring what it is supposed to be measuring.
Chapter 4.0: Findings and Discussion

In this chapter the company and the demographics of the respondents are described. The research findings and results relevant to the literature in the areas of work redesign, organizational learning, decision-making and job autonomy are then discussed.

4.1 Overview of the Company

The company involved in this case study was a private Canadian-owned international customs brokerage firm that had been in operation for over two decades. The customs brokerage import and export business had historically been a paper-based, labour intensive and time consuming process for the shipment of goods across the border. The primary mandate of this company was to ensure that client shipments were cleared into Canada. In 1995 the company managed three million transportation shipments.

Largely through the leadership of the company president, a decision was made by senior management to invest $12.5 million to “transform its trade division from a transaction-based customs broker to a North American leader in international trade and information management”. This investment was to incorporate information technology throughout the workplace and to use technology solutions to provide customer access to customs and trade information.

In order to implement the new vision the company was required to adopt new values, create a new organizational culture, develop new capabilities, adopt new organizational structures and completely redesign the work of the sales staff.

In reviewing the training materials used when the work redesign was implemented, the researcher found that the trainers described the need for change as “a
business necessity to improve our competitiveness and to reposition [company name] in the market”. The focus of the work redesign was to structure and implement processes that would support new products and services in response to an emerging client need. In order to achieve the new vision they advised employees that they “needed to strengthen the company’s people, processes and technology”. The newly designed organization created new positions and new roles and responsibilities. It also introduced teamwork and the requirement for new working relationships.

The work redesign project was planned and implemented by the executive team with the support of a consulting firm. Five existing sales staff from the Toronto area were recruited for a six month pilot project to investigate the impact of the implementation of the new work structures before the new organizational structure was introduced throughout the entire company.

4.1.1 Description of Respondents

The researcher aggregated the data from across Canada into three regions (identical to the geographic delineations structured by the organization) to protect confidentiality. In Central region (Ontario) twenty-four people were interviewed, ten women and fourteen men. In East region (east of Ontario) thirteen people were interviewed, six women and seven men. In West region (west of Ontario) seven people were interviewed, four women and three men.

The company described the sales job function as “Business Development Specialist Internal (BSDI)” or “Business Development Specialist External (BSDE)”. The BSDI worked within the branch office to make telephone contacts and sales, prepare
proposals and quotes, schedule customer site visits for the BSDE, forward promotional mailings and so on. The BSDE worked “on the road” from his/her own home and made site visits to prospective customers.

Of the forty-four people interviewed, there were fifteen female BSDIs (in office settings) and five female BSDEs (on the road). Of the eight Business Development Specialists Internal in the Central region, four of the Central region BSDI women were responsible for all transactions to Canada from the United States and worked in a separate department. There were six male BSDIs (in office settings) and eighteen male BSDEs (on the road) across all three regions.

Company Tenure

Within the company, twenty-three people (over half the study group) had been with the company more than three years and the majority of the group over five years. Three people had been with the company more than two and less than three years. Of the forty-four people interviewed, eighteen Business Development Specialists had been hired since the introduction of the computerization of the job functions. Of the fifteen employees who had been with the company up to two years there were nine BSDIs and nine BSDEs. All eighteen participants with less than two years experience reported that they were new to the customs brokerage business as well. Although the people hired within the last twenty-four months could not discuss aspects of their job before the adoption of computer technology, they were still able to discuss their current perception of the impact of technology on decision-making and job autonomy and therefore, remained included in the study.
Education

Eighteen sales people had a university degree, eleven sales people had a college diploma, ten sales people had high school or less education and five people did not respond to this question. All respondents with high school or less education had at least three years or more tenure with the company. Of those eighteen people employed within the last twenty-four months, five respondents had a college education, twelve employees had completed a university degree and one was “no response”.

Since the introduction of computer technology in the last two years, the job qualifications and required skill sets changed somewhat and familiarity with personal computers became one of the hiring criteria. Managers also reported that they were looking for people who were independent, creative, had selling experience, a good sense of organizational skills, good communication skills and high energy.

4.2 Work Redesign

Work redesign is defined as “activities that involve the modernization of specific jobs with the intent of increasing both the quality of the employee’s work experience and their performance” (Hoy & Miskel, 1987, p. 199). Most work redesign initiatives provide employees with increased opportunities for autonomy and self-direction in carrying out the work. Employees are assumed to have the competence and sense of responsibility to actively contribute to the organization (Hackman & Oldham, 1980).

Considering the tenets of a sociotechnical systems design approach, the researcher asked the employees about the specific changes to their job (technical aspect of computer technology and new work procedures) and the impact of the job that they experienced
personally (social and psychological aspect) as a result of the company restructuring. The social and technical systems are inter-related and must be examined together to achieve joint optimization.

4.2.1 Technical Change

The technical aspects of the work redesign include the physical equipment and physical environment. The equipment is considered in terms of its capacity, sophistication and efficiencies of use.

When the new information technology was introduced, each internal sales person was given a 486 desk top computer linked through a local area network to a centralized database. Each external sales person was given a 486 laptop computer with network capability and a modem. All computers were set up with Microsoft Office and a customized contact management program called Goldmine. Some of the external sales employees chose to purchase access to the Internet, faxing and printing capability from their home office at personal cost. Only the people within the sales department in each region had access to the local area network and the regional customer database contained in Goldmine. Goldmine contained directories of all potential customers and tracked all contact made from any one of the salespeople. It also offered an electronic mail program at the regional level. Each salesperson's computer was set up with written information about all of the services the company offered with supporting sales promotion documentation.

When the computer technology was introduced to the employees the company also purchased a technical “software factory” to develop and produce customs brokerage
software programs for sale. The external sales people were equipped with copies of the software programs on their laptop computers so that they could provide multi-media demonstrations at the customer site. (The software company also provided telephone technical support to both the customers and the sales staff who experienced any hardware or software problems.)

Employees from all departments located internally in branch offices across the country had access to a wide area network called Locus. Locus was considered to be an operational tool and contained the centralized databases from all departments (credit, marketing, service, etc.), electronic mail capability, executive information systems and universal file sharing (with password restrictions). The regional information contained in Goldmine was not accessible to Locus and so contact management information was not shared nationally. Information was entered into the Locus program once a customer was "signed on", not at the preliminary contact stage.

4.2.2 Social Change

The social aspects of designing the work includes such areas as: organizational structure, organizational learning, levels of responsibility, communication networks, interpersonal relationships, reward systems and job autonomy.

At the time the company introduced technology and changed their information systems, the employees experienced significant changes in their job description and job functions including such things as the development of teams, the loss of administrative support staff and new compensation programs.
4.2.3 Organizational Structure

One consequence of the adoption of computer technology is structural change in organizations. New technologies demand new teams, new skills and new job descriptions. When the company under study introduced personal computers to all of the salespeople across the country in January, 1996, it also made several changes in job functions and organizational structure.

First, several staffing changes were made. In the Central region middle management was reduced by three employees, administration was reduced by two employees and the remaining administrative jobs were focused away from sales support. Four to five existing salespeople either left or were let go and six new Business Development Specialists were hired (staff complement changed from eighteen to twenty-four BDSs). In the East region five salespeople either left or were let go (positions were filled with new staff) and two additional BDSI positions were added. The West region maintained three original staff since the work was redesigned. Five people either quit or were let go and two people received new jobs in the company. The overall end result was the addition of several full-time sales positions to the staffing complement. However, through the technological change process almost half of the original workforce was replaced, including some longtime employees who had been with the company for more than ten years. When interviewed, the managers advised the researcher that the restructuring of the jobs and changed expectations of the work highlighted some individual performance concerns and provided the opportunity to “move people on”. Some employees simply refused to accommodate to the changes and chose to leave of their own accord.
The staffing changes are consistent with Menzies (1984) research, in which she found that with the adoption of computer technology, the job functions required more skilled and knowledgeable workers and that less skilled workers lost their jobs. The findings clearly indicate that some employees in this company were displaced through the restructuring process and that the remaining employees had to learn new skills and adopt entirely new work processes to survive in the restructured work environment.

Second, there was structural change in the assignment of work. Before the introduction of information technology, each salesperson approached any importing and exporting company of their choice as a potential customer. Often the salespeople developed “niche markets” and established long-term customer relationships over time. This was partly because they also performed an ongoing service support function for existing customers. BDSs may or may not have chosen to work in an area close to their own residence. When computers were introduced across the company each sales representative was assigned a designated territory to work in (delineated by postal code and Statistics Canada data on the number of businesses and economic potential). This severed existing customer service relationships and dramatically changed working relationships that had been developed over many years.

In the Central region, all twenty-four Business Development Specialists stated that decisions about who would work in which territories was made without their input. Only a couple of BSDEs with more than five years experience requested (and were given) territories that they were most familiar with and where they had previously developed good customer relations.
The assignment of territories without employee input was also stated as a common response in both the East region and West region. However, many of these were predominantly new staff who had applied for positions after the territories were assigned, and they expressed less concern about the lack of input into the decision.

When asked how territories were assigned, the three managers across the country responded that they tried to offer territories close to where Business Development Specialists External were living. The managers also advised that efforts were made to try to design territories that had similar revenue potential based on economic factors within each territory.

Several Business Development Specialists spoke about the differences between territories, even within one region. For example, respondents who worked in the more rural and remote areas of the country suggested that a more laid back, “soft sell” approach was best suited for these areas. Experienced Business Development Specialists remarked on the “personalities” of territories and how they should be matched with the styles of the salespeople. The consensus of respondents outside the Greater Toronto Area was that senior management (located in the highly populated urban centre of Toronto) expected all BDSs to work within identical job parameters and sales approaches. Business Development Specialists commented on how well they knew their territories and their customer base and were critical about the lack of input they had into senior administrative decisions about how they managed their own territory. It was expressed by BDSEs across the branches that management made decisions based on quantitative information (for example, revenue generated per month, number of trade transactions per company, territory business potential projections) without consulting the “in the field” staff about
their front-line personal knowledge acquired from their face-to-face customer experience. The BDSEs suggested to the researcher that they had valuable information that they were willing to provide to management upon request.

A third radical structural change in the organization as a result of the introduction of personal computers was the requirement that Business Development Specialists External set up a home office with the new technology and work from home (termed “telecommuting” or “flexplace” work). In the past, all salespeople who were “on the road” had been expected to be physically present at the branch office to report to the supervisor at the end of each day. With the support of the technology, including modems and electronic mail capacity, external sales people were now expected to communicate with the branch office at least once daily electronically, but not be present physically.

Information technology introduced the ability to work anywhere, anytime for half of the workforce (the Business Development Specialists External). Those respondents working from home were highly supportive of the company providing the opportunity for them to schedule their own activities and manage their own time completely independently. Several people said, “I’d never go back (to a non-computerized work setting)”. All of the Business Development Specialists External with whom the researcher spoke with preferred working at home to going into the office. This was indicated in comments such as the following:

My work is more convenient because I can work at home and live very close to my territory, I don’t have to go into rush hour traffic so I can work while everyone else is sitting in traffic (East region);

I get very distracted in the office and I am much more productive at home with my office in a private space (East region);
I can be more productive, for example, do proposals at night and meet clients by day (West region).

In several studies (Joice, 1993; Verespej, 1994; Romei, 1992; Roha, 1997) the work-at-home findings are very positive in the areas of job performance, quality of work life, reduced sick time and absenteeism and increased motivation towards work. Managing teleworkers requires traditional organizational administrative structures to be revised. Managerial methods must shift away from direct observation or “face-to-face” supervision and monitoring the length of time at an activity to management by more formal contact and assessment of quality and quantity of output (Pancucci, 1995). This is consistent with Chernes’ (1976) sociotechnical systems design principle of minimal critical specification. That is, specifying what is to be done (outcomes) rather than how it is to be done. In this study the technology was used as a support tool for achieving measurable outcomes anyplace and anytime without management closely supervising the process.

There are certain perils to working at home that also surfaced in the findings. Now that the technology was available at home, thirteen of the twenty-three Business Development Specialists External stated that they were often inputting information into the contact management program (called Goldmine) on evenings and weekends and working far more than a forty-hour work week. There is the risk of slipping into workaholism when working at home. The literature also suggests workers may find it difficult at times to separate their work life from their family life, and mentions the numerous distractions that may be found at home, but no one in the study expressed these concerns.
The fourth, and perhaps most significant change with the introduction of computer technology from a sociotechnical perspective, was the partnering of a Business Development Specialist Internal with a Business Development Specialist External to manage a specified territory. This required the creation of additional BDSI positions in each branch office across the country.

Before the work redesign initiative, there were sales staff out in the field making cold calls on prospective customers. The sales staff also had a service support job function for existing customers and they managed their own accounts. Within the branch office there were administrative support personnel who typed proposals and quotes and received customer telephone calls on behalf of the sales/service employees. When the computer technology was introduced, management changed the external role to strictly sales (all service support was moved to another department) and partnered each external person with an internal sales person. Two-person teams were instructed to "manage their own territory like their own business" to reach an assigned sales revenue target.

Requirements were put into place mandating that a specified number of contacts to prospective customers be made (with back-up documentation) on a daily and weekly basis. Both partners together were expected to contact all potential customers, schedule visits and demonstrations for the Business Development Specialist External (BDSE), jointly manage the territory and split sales revenue. Each Business Development Specialist Internal (BDSI) was given a personal desktop computer and had access to all internal company information on the wide area network called Locus. Each BDSE was given a laptop computer with a built-in modem to synchronize electronically with their BSDI partner on a daily basis so that the same updated information (including a calendar
for site visits) was current on both machines. According to the research interviews, this “partnering” had worked very well throughout most of the company by promoting teamwork and supporting shared knowledge-building between new staff and those with more experience. This is consistent with a sociotechnical approach where work is designed so that members of a team share responsibility for carrying out meaningful work. Partners were encouraged to develop close ties with one another and share decision-making about how the work should be planned and completed.

Through the restructuring, the experience reported by BSDs was that they had no involvement or input into the assignment of their partner. Managers reported that with several new staff starting at the same time “it didn’t make any difference” who was paired with whom. Another acknowledged that he decided who would be paired together “based on his experience with people” and that there had been some “bad fits”.

One of the respondents in West region reported, “Teaming is run like a business and like having another husband so it has to be a good fit to make it work”. Each team was given a sales target and shared commissions from the combined business they generated within their designated territory. They were expected to connect daily to keep each other informed and manage their appointments, etc. This was not considered a welcome change by some of the sales people who had been with the company for more than five years. They stated that being assigned territories limited their sales potential and they actually lost personal income through the change and that having “mandatory” partners limited their independence.

Within recent months in the West region, management had begun to involve the potential partner in the hiring process. One respondent stated, “My external partner chose
me, we met before I started the job and now we have a good working relationship”. It was surmised by the researcher that a team that participated in choosing each other as partners would work better together and likely be more successful than one that did not.

Underlying the principles of sociotechnical systems design is the concept of moving control from the manager into the hands of the workers in those areas that directly affect their work. In a large scale study in Australian telecommunications it was found that greater perceived performance at the team level had a strong positive impact on the extent of satisfaction experienced in the job (Zeppane, 1994). Weisbord (1987) calls this “shared authority” and considers it critical in productive workplaces.

The findings of this study show that although the company redesigned the work to become more team-based and to encourage employees to take responsibility for work outcomes, the implementation strategies remained caught in the traditional structure of authoritarian assignment without consultation or discussion.

4.2.4 Job Function

When the researcher asked if there were any changes made to their job duties, responsibilities or behaviour in comparison to the job before the introduction of information technology, every person (except two) who had been with the company more than two years gave a definite yes (n = 24). Two people (longtime employees over the age of sixty) said there was no change to their job as they were permitted to continue to work in the same way as they had in the past. Forty-eight per cent (48%) of the respondents (n = 18) were new to the Business Development Specialist position (hired since January, 1996) and were unable to answer this question.
There was 100% consistency across the country in response to the question “please describe the key functions and responsibilities of the Business Development Specialist”. All respondents agreed that acquiring new business was of primary importance. (Company expectations of assigned sales quotas, number of daily telephone contacts and site visits and various incentive programs supported this key function.) The consistent response suggested to the researcher that the orientation and training of new recruits to the responsibilities of the job was clear and informative and well expressed by the company.

In selling software solutions (also introduced when the computer technology was introduced), several respondents mentioned the work they were doing in providing service support to major accounts, although they confided that “they really weren’t supposed to be doing that”. Many Business Development Specialists felt divided between the need to provide operations support to retain an existing client (and therefore have future “upsell” opportunities) and the acknowledgment that it was outside their expected new role, actually detracting from the key function of selling. This caused some frustration and effectively reduced morale for some BDSs in all branches of the company.

In addition to changing the job description to strictly selling when the technology was introduced, the company also mandated the use of a contact management tool (called Goldmine) that was installed on each computer and all administrative support personnel were reassigned. The new job expectation was that each sales person would contact the suspect (a potential customer), prepare a proposal (customer is now considered a prospect), mail brochures and reading materials, follow-up with a quote and letter (based on generic templates provided within their own personal computers) and secure the
business (make the sale, complete credit reference check, etc.). Each two-person team was responsible for the complete process without the clerical support that had been available before the introduction of the information technology.

All of the information required to do the job (research customer database, build quotes, prepare proposals, write letters) was made readily available within the information system accessed by the computer. Everything required to do the job was “at your fingertips”. In addition, the Business Development Specialists External demonstrated the software solutions they were selling by using their laptop computer at the customer site.

When the Business Development Specialists were asked, “Is it possible to do your job without using the computer?” sixty-one per cent (61%) of the sales people stated that it was “technically possible”. For the most part, respondents agreed that the sales function could be accomplished without using the computer as it had been done like that in the past and it could be again. A couple of people who had hardware problems and were without their computer for several days had reverted back to a paper-based system by necessity. However, most people expressed concern that taking away the computer technology now would reduce productivity, reduce efficiency and reduce competitive edge. As one person said, “It would be like a baby without a pacifier, you could live but you would be very unhappy”.

The most common concern expressed (by over fifty-five per cent of the respondents in all three regions across the country) was about the dependency on the computer, now that it was being utilized to complete the majority of information management functions, and the potential loss of business with technological breakdown.
The most prevalent contrary opinion was frustration with “down time” when the personal computer and/or the local area network were not working. All scheduled appointments, call backs, customer contacts, letters and so on were in the computer and when it was not working there was no way to find out commitments that had been made or tasks to be completed. For this reason, those people who had experienced problems in the past did not trust their personal computers and often kept manual records and a written daytimer as a contingency back-up plan. This, of course, meant duplicate work.

Another concern which surfaced across regions was the impression that the information technology required additional hours of work and was not considered a support tool as originally introduced. Comments were made such as, “Sometimes people get too caught up in the technology”, and “If focus is totally Goldmine [completing all the data entry required by software program] then it takes away from sales time”. For some respondents it was felt that there were unrealistic expectations about the use of the technology, by management and others. For example, the technology could somehow even do the sales job for the person. As one person stated, “If the computer could sell I would send a demo disk to the customer and wait for the call”. It was observed by the researcher that management mandated the use of the personal computers to do the job and this caused some confusion in learning the new roles. Some Business Development Specialists reported that their colleagues were focusing on keeping all the data updated and current rather than performing the key job function of selling and that they were allowing the computer to direct their activities. These findings support the concern found in the literature that for some people there is general apprehension that computers will dominate our lives rather than be controlled by the user (Ramo, 1983; Tapscott, 1996;
Thayer, 1968).

On the other hand, the majority of Business Development Specialists acknowledged that the personal computer was a valuable tool to assist them in their key job functions and that their job would be much more difficult without it. As one respondent stated, the introduction of computer technology had been “like a double bladed sword. On the one hand it is great because it is more productive and effective with information at your fingertips and with multimedia presentation opportunities. But it is a major administration bind because now we do all our own memos, proposals and updates”. The most commonly stated “pro” of the technology was the personal improvement in time management and organization in the job that was facilitated by the personal computer. Fifty-seven per cent (57%) of the Business Development Specialists responded that their job was easier with the software program Goldmine available as a sales support tool. Related to the better management of time, forty-three per cent (43%) stated that the information technology increased their productivity and efficiency in completing the key functions of the job.

**Quantity of Work**

Eighty per cent (80%) of the respondents stated that there had been a slight to large increase in the quantity of work that they did since the adoption of computer technology (see Table I). Of those, fifty-nine per cent (59%) indicated it was a large increase. This was mainly a concern for employees who had been with the company more than two years because they had experienced a dramatic change in the performance expectations with regard to the quantity of work. It was less of an issue for the newly hired employees because this was their total experience with the company.
Table I

Summary of the Impact of Information Technology on the Quantity of Work

<table>
<thead>
<tr>
<th>Response</th>
<th>Central Region</th>
<th>East Region</th>
<th>West Region</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slight decrease</td>
<td>1</td>
<td>1</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>No change</td>
<td>4</td>
<td>1</td>
<td>2</td>
<td>7</td>
</tr>
<tr>
<td>Slight increase</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Moderate increase</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>Large increase</td>
<td>16</td>
<td>8</td>
<td>2</td>
<td>26</td>
</tr>
</tbody>
</table>

Note. Each number represents the number of respondents who made the response. Total $n = 44$
Respondents reported that one major advantage of having a personal computer and a contact management program like Goldmine was the improved management of time and increased organization of their work. Almost all respondents across the country commented on the advantages of the scheduling and tracking aspects of Goldmine when it was in full use (including built-in alarms for overdue calls or reports, automatically scheduled call backs for months in advance, notes about customer comments and interests and links to letters or past quotes). One person stated, “I am more efficient and better able to juggle more things at one time”, and another said, “I can schedule thirty calls per day because the information is easily accessible”. The respondents who indicated that there had been an increase in the quantity of work also stated that they were more productive and efficient since the introduction of computer technology.

One over-riding concern expressed throughout the company was the increase in the number and complexity of work processes tied to the computer in several areas. For example, Goldmine was introduced as a sales support tool for the BDSs only. The paper-based processes throughout the rest of the company did not change. Although Goldmine was available across the country (including an electronic mail capacity), Goldmine did not “talk to” or link with any other program or departments, including the internal network, Locus. Therefore, all customer information had to be downloaded and printed, then faxed to the appropriate department rather than a direct soft copy sent electronically. All of the completed forms required in other departments (like credit) continued to be hard copy paper requests.

Goldmine had several fields of data which the salespeople completed with a wide
range of diligence for various reasons. Some of the information requested seemed too intrusive with a brand new customer and so was not asked, some of the fields were not considered relevant by the BDSs so were rarely completed and some BDSs didn’t consider the administrative requirements of the job to be a priority.

With the introduction of computer technology management concentrated on outcomes and the impact on sales. Therefore, specific job expectations had been put into place (i.e., the number of telephone calls to new suspects per day) and particular measures of work had been introduced. Initially, it was expected that by inputting the customer data into the Goldmine program that the software would automatically generate “key performance indicators” at the end of the day. However, this aspect of the program had remained technically unfeasible. Therefore, the Business Development Specialists were required to manually record all of their activities at the end of each day to then forward to management.

Several Business Development Specialists commented on having no input into decisions about what kinds or reports or statistics they were expected to generate. The technology brought new job requirements for additional work processes. At the time of the study, most of these work processes continued to be done manually which represented increased paperwork and administrative responsibilities. When the researcher inquired about this, one of the managers acknowledged that they were requesting abundant information from the employees to measure the success of the technological change. He also admitted to the researcher that it may be timely to review the numerous data collection requests being made to staff and to reduce them to only those considered most relevant and informative for management.
It is consistent with the literature concerned about the negative aspects of computer technology that management would now have the desire to gather more statistics and measure more data with detailed information centralized and accessible in one place. With the introduction of technology, the company in this study required employees to document far more data than before its implementation. Information technology can facilitate the decentralization of control by providing abundant information to all levels of the organization. However, the findings indicate that within the redesign of the workplace the management organizational structure did not change in the company under study. Management continued to make highly centralized administrative decisions and enforce standardized operating procedures rather than use the technology to support a decentralized work environment.

Several respondents in this study expressed the feeling that the adoption of computer technology had also dramatically increased expectations about productivity. One person stated, "The focus seems to be on numbers rather than the quality of the job, some people may even ‘fake’ the number of calls to get management off their back"; and another who commented, "I’m working twice as hard as before the technology but receiving less money". The general consensus from the interviews was that the company had invested significant funds to purchase the services of a consulting firm and to computerize the workforce and therefore had put unrealistic sales targets in place to recoup the investment as quickly as possible. Those that couldn’t “take the pace” or the new work demands were no longer employed at the company.
Quality of Work

In response to the question about quality of work (see Table II), interviewees had difficulty saying their quality had increased since they felt that they already did high quality work. One person in the West region responded, “It is always difficult to differentiate between people skills and technology impact”. Eighty-nine per cent (89%) of the respondents said that there had been a slight to large increase in quality, largely in reference to the quality of the product. With existing templates for standardized letters, business development profiles, quotations, automatic calculations, algorithms for rate structures and proposal formats there was much more standardization and consistency across sales people and across branches. People spoke with pride about their professionalism and working for a company that was on the leading edge in the industry. Respondents also mentioned that they had received personal feedback from customers complimenting them on written presentations and demonstrations that they had done. The salespeople spoke with confidence about having “the competitive edge” because they knew their materials and presentations were professional and represented industry leadership since the adoption of the computer technology.

The introduction of computer technology provided the tools and resources to implement consistency in the sales process and the documentation methods used throughout the country. The scope of responsibility of the job was clearly articulated and understood by all respondents. However, some people commented:

We are expected to think the same as someone in a different environment altogether and be uniform across the country and this dehumanizes people by rejecting individualism (Central region);
Table II

Summary of the Impact of Information Technology on the Quality of Work

<table>
<thead>
<tr>
<th>Response</th>
<th>Central Region</th>
<th>East Region</th>
<th>West Region</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slight decrease</td>
<td>1</td>
<td>1</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>No change</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Slight increase</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>Moderate increase</td>
<td>5</td>
<td>3</td>
<td>3</td>
<td>11</td>
</tr>
<tr>
<td>Large increase</td>
<td>14</td>
<td>7</td>
<td>1</td>
<td>22</td>
</tr>
</tbody>
</table>

Note. Each number represents the number of respondents who made the response. Total $n = 44$
There is a need for technology but it standardizes people, the computer is supposed to be a support and be designed to help, not to run the person (East region);

You lose the human factor (East region); and

You have less contact with colleagues, I can even just e-mail the BDSE if I want, we don't have to talk to each other, it is very impersonal (West region).

The above comments are consistent with the controversy in the literature about the negative impact of information technology on work and people. Computers are seen as socially isolating, alienating and dehumanizing, thus reducing the meaningfulness of work. Before the introduction of personal computers in this company, each salesperson worked independently throughout the region to generate as many sales as possible. This had involved various activities such as going door-to-door, calling new businesses on the telephone, connecting with existing customers to expand their purchases or requesting the secretary to conduct a promotional mailing. The introduction of technology brought restricted territories of work and specific expectations about the number of documented telephone contacts that would be made on any given day. In this respect the work requirements became more formalized and rigid with information technology.

4.3 Organizational Learning

The restructuring of the whole organization, including the introduction of computerized work processes, was introduced in January, 1996. The research interviews were completed in October and November, 1997. Although some people had difficulty remembering the specifics of stated objectives that management had originally expressed, seventy per cent (70%) of the respondents across the country agreed that objectives had
been clearly established and articulated at the outset. One person commented, "You had to be deaf and blind not to hear about it". People who were hired later on in 1996 and 1997 were less likely to be familiar with the vision, value or stated objectives of the company beyond the expectations of their immediate job.

As evidenced in the responses, those Business Development Specialists who stated that there were specific company objectives established at the time the information technology was introduced had a wide range of interpretation of exactly what the company philosophy, vision and objectives actually were. The most common response across the country was that the technology was introduced in order to provide a competitive edge and to increase business. Responses included: "To get into the 21st century", "The world was changing and we had to be modern in thinking...to survive", "To keep up with the new age", "Company wanted to change their way of doing business in order to be ahead of the competition", and "To get in the now".

This was consistent with the managers' responses to this question. One supervisor stated that the technology was introduced "to become the leading information manager doing trade business in North America"; another said it was "to increase business development revenue and productivity".

Many respondents commented that they had little or no experience with personal computers before the introduction of technology in their job. Several people freely admitted that they had been very fearful of and resistant to the radical change in their job requiring the use of a personal computer to do their work. In fact, almost half of the original job incumbents had left the company since this change was mandated. One can see that the required change in job function had been significant in that seventy-three per
cent (73%) of the respondents stated that they now use their computer more than twenty-one hours per week and they had not used a computer at all (personally or at work) two years before. Some of the additional hours of work effort may also reflect continued learning needs about the technology and programs used during working hours. Several respondents commented on the need to practice “hands-on” to learn how to best use the personal computers as a resource for their job.

In the past decade, organizational theorists have focused on the need for organizational learning (Senge, 1990; Drucker, 1988; Watkins & Marsick, 1993). The enormous potential of information technology has a large impact on people and their ability to work and learn. Using the information technology in an optimal way increases the organizational capacity within the company because it capitalizes on the ability of individuals to learn, adapt and change. Well designed and fully trained teams that are kept informed are then capable of responsible self-direction and decision-making.

The company in the study was strongly supportive of on-going training and continuous development. In the Mississauga branch office the researcher observed pennants on the wall that said, “PTI University: Higher Learning, Higher Earning”. (PTI stood for “Prospect To Implementation” and was the name of the sales group department.) The company’s internal newsletters and training materials indicated that when the information technology was introduced all sales staff participated in a three week conference called “PTI-U” (Prospect To Implementation University). Higher learning was reflected in everything from an opening procession of gowned deans to the diplomas that staff received at the completion of the course.
Business Development Specialists could request additional courses, including off-site courses offered by local colleges and universities throughout the year and have costs subsidized by the company. There was regular on-going training internally on new software solutions and various seminars and workshops on selling techniques and customs brokerage information.

The researcher asked specific questions about professional development and training to determine if the organization was utilizing the full capacity of the information technology to support and develop abilities of the staff. When asked how much training was provided at the time the technology was introduced company-wide, there was a wide range of responses based on the wide range of individual experiences. In answer to the question, when the technology was first implemented in January, 1996 there was a large investment in training by the company. Training included introduction to the technology itself as well as software programs such as word processing, aspects of the customized contact management program (Goldmine), and spreadsheets. In addition, there was education on the new vision and objectives of the company and rationale for the complete restructuring of the sales division. Training was mandatory and fifty-two per cent (52%) of the respondents stated they received anywhere from two to three weeks of training.

Conversely, Business Development Specialists hired after the structured training program was completed had dramatically different experiences. Many stated that they did not receive any formal training at all. They learned from colleagues or their supervisor and often from trial and error in using the various programs.

Of particular concern to BSDEs who were remote from the branch office (in all regions across the country) was the difficulty in accessing the on-going training offered
internally due to distance and expense. Some respondents expressed feeling isolated from the support that they thought they needed to upgrade their skills in the technology. One person recommended that refresher courses in Goldmine be offered on a semi-annual basis for all Business Development Specialists. Several BSDs who felt quite proficient in the technology suggested that an advanced course in the use of Goldmine would be useful as they were convinced that they were not utilizing the tool to its full capacity.

When the researcher asked if Business Development Specialists had access to ongoing support in the use of technology, every respondent except three people in the East region said yes. Two service centres (one in the East and one in the West) did not have an on-site technical support person. The sales representatives in these areas had to call Toronto, Montreal, or Vancouver for telephone support. In addition to internal staff requests for problem resolution, the technical support people were also expected to resolve any problems customers were having with their software purchases.

There was a more mixed response to a question that asked whether BDSs felt that they had sufficient technical support. Of the total responses, sixty-eight per cent (68%) stated “yes”, they received sufficient technical support. When the new technology was first introduced, people were still learning about using personal computers and there were several problems with the software programs (“bugs”) that required resolution. Some respondents also stated that they initially had hardware problems. Therefore, in the first six months of the reorganized work force, respondents reported a lot of frustration with the inability to access immediate technical support. There was also concern expressed that a BDS technical problem was considered a lower priority than a customer complaint and therefore had a slower response from the technical support staff. (In recent months, the
company had employed on-site technical support staff in the main branch offices which had greatly improved the access to immediate support on request.

In order to be a "learning organization" (Senge, 1994) employees must have the opportunity for increased self-direction and the freedom to learn from their own mistakes. When the researcher asked, "What happens if you make a poor decision?" only a couple of people interviewed admitted to ever having made one, although all respondents were willing to hypothesize what might happen. For the most part, sales is a risk-taking kind of occupation where a mistake often means loss of a sale and consequently, loss of personal income. Every respondent felt confident that they would be supported by management in the mistakes that they made and be expected to learn from them. Not one person expressed concern that he or she was limited from making decisions or taking risks in order to make a sale. As one person summed up, "Generally there is support within the organization to rectify a mistake...there are not too many repercussions, it is part of the job, nobody’s perfect". Another person stated, "If you don’t make mistakes you are not working hard enough". Respondents were consistent in saying that they would “live with it” if they made a mistake and expect to learn from it so that it would not be repeated.

One of Chern’s (1976) principles of sociotechnical design is termed “information flow”. This principle states that information should be provided in the first place to the point where action based on that information will be needed. Information technology can supply members of a work team with the right type and amount of feedback for them to control any unplanned event within their area of responsibility and also give employees the opportunity to learn from their mistakes. In this way people can anticipate events in the future and make decisions about how to best control their own work environment.
The findings indicate that one of the biggest strengths of the company was the strong learning culture that it supported and promoted. Using personal computers to perform the job was a completely new experience for the majority of sales people and it required a completely new set of skills. The company offered on-site daily technical support, facilitated peer support and provided several opportunities for continuous learning on an on-going basis.

4.4 Information Flow

Information is critical to decision-making. Organization theorists propose that if employees have access to information relevant to their job and actively participate in decision-making, they will also be better able to implement the decision (Lewin, 1951; Anthony, 1978; Quick, 1991). They also hypothesize that employees have more direct knowledge of their own work than management, and productivity will be strongest for decisions that utilize the expertise of the individual and teams.

With technology there is no longer a problem in providing abundant information to every level of the organization. It is now possible to provide everyone with a total picture of the organization as well as local information at the same time. Workers can have access to the information they need to do the job well and to be creative in generating new ideas or techniques. However, problems may arise in corporations because the information that is made available is not relevant. For employees to make good decisions, the message, report or data must be related to the context of the decision situation. Hierarchy and departmental divisions can influence how information flows and may be used by people at different levels to “gatekeep” or filter information.
The researcher asked specific questions to discover what information Business Development Specialists received relevant to their job and what impact, if any, the information technology had on the flow of information. It was found that the company made formal efforts to communicate information across all branches on a regular basis; predominantly through internal newsletters, written memos and Locus “world broadcast” electronic mail messages. It was the researcher’s impression that the company management had made a conscious decision to provide as much information as possible to support the sales staff during the restructuring and redefinition of the job, both at the time of computerization and on an on-going basis. This impression was based on the four newly developed internal newsletters (on various related topics and promotional items) that were automatically circulated to all staff each month in addition to daily memoranda and voicemail messages.

The primary way that new information was communicated throughout the company varied across regional offices. This was likely more of a reflection of the management styles of the regional managers than a communication strategy of the organization as a whole. For example, the staff in Ontario received several voicemails on a daily basis as the preferred communication tool of the manager. In East region most information continued to be communicated verbally (informally through conversation) or through paper written memoranda. In the West region information was received in several ways but the most common was electronic memos.

All branch offices across the country had access to an internal wide area network including a centralized database and electronic mail. This network was only accessible to people located in the branch offices. Very few sales people reported regular use of this
company resource. There was a much wider use of internal newsletters and written memoranda to provide information relevant to the job.

Except for a few people in the West region, the findings did not show that the introduction of computer technology had changed the way internal information was communicated after two years of implementation. The information technology was introduced to the sales group as a support tool to increase efficiencies and productivity. More detailed prospective customer information was made available and accessible through computer technology. One full-time position was created in each region to input all business listings, contact information, competitor information and territory information into Goldmine. Half (50%) of the Business Development Specialists across all branches stated that they predominantly used their computer for “sales leads”. Only eighteen per cent (18%) of the respondents stated that they received (or forwarded) information through electronic mail.

The researcher asked the respondents if they now had information relevant to their job that they had not had prior to the adoption of computer technology. Before the adoption of computer technology, respondents had access to customer profiles, proposals, rating systems and so on through a paper-based system kept on record in filing cabinets in the branch offices. When asked this question, fifty-nine per cent (59%) of the respondents said yes, they could now access information faster, the information available was more detailed, and the data management was more logical and accurate (information was all kept in one place with electronic links). Several respondents commented on having “information at my fingertips” as a significant advantage since the implementation of computer technology. The ability to access information about potential customers and
specific data about the territory, to track all activities with every customer contact electronically and to know where that information was stored for quick reference and retrieval, enhanced their sense of job competency and supported the ability to make autonomous decisions.

Parameters for setting rates, templates for writing quotations and automatic calculations performed by the technology supported accuracy and consistency among all of the staff. This automated information also supported individuals in making the decision to pursue a potential customer or not, without the need to consult with a manager.

The respondents who said “yes” to new information access also stated that use of the Internet was new to their jobs. One person in the East region mentioned that “If I’m calling a Fortune 500 company then I go on the Internet and get information [about the company] before making the call”. This allowed the Business Development Specialist to be an informed caller and enhanced the professionalism of the job. It was indicated by the findings that Internet access was inconsistently used across the branches. Each branch office had at least one computer with Internet access, however, that was not accessible for BDSs who were remote. One person in Central region stated that Internet access was limited because “there is an expectation that people will use it inappropriately but they have also been told to sell to the top which is where that [customer] information is”. Some BDSs External had personally installed Internet access in their home office (at their own expense) for professional and personal use. According to the manager in the West region, every BSDI/BSDE team now had Internet access to support their work.
When asked how often Business Development Specialists receive information of low value or little use to their job, in Central region ninety-two per cent (92%) of the respondents said “sometimes or regularly” and in both East and West regions all (100%) of the respondents said “sometimes or regularly”. Respondents commented, “I have to skim, read and toss”, “If I read everything then I wouldn’t make a single sales call”, “Information is a necessary irritant”, “There is information overload”, “There is so much information that you can’t find your desk”. The company was making every effort to keep the Business Development Specialists as informed and current as possible in support of their new job functions but the findings illustrate that this was not through the use of technology. The company regularly circulated several internal newsletters generated from the Marketing Department, updates from the Regulatory Affairs Department, daily memos, external journal articles and information, promotions and blitzes, conference and trade show information, business reports, competitor updates as well as all daily mail in paper format. Daily Locus broadcasts had limited use by Business Development Specialists.

The manager in West region informed the researcher that he was piloting the electronic transmission of information (including newsletters, memos, etc.) from within the company to the Business Development Specialists. Due to the vast amounts of information, he was also quickly screening the information and highlighting points of relevance for the staff so that they did not have to read it all themselves.

Although almost all respondents agreed that they sometimes received information of low value or little use, they did not want to stop receiving it. When the researcher probed further and inquired about what information should be made unavailable, the
majority of respondents advised that they continued to need all the information because there could be some items of relevance within it which would impact a decision pertaining to a customer in the future.

It is suggested in the literature that there is a purported risk of information overload with the introduction of information technology through the generation of hundreds of daily e-mails and electronic memoranda. The findings in this study did not support this concern. Respondents indicated that they were receiving much more information than they had before the restructuring of the job but it was not necessarily related to the information technology.

4.5 Communication

Information itself is objective, logical and specific. Communication is a process. It seeks or uses the information required for decision-making. It is the patterns of communication between people and how the information is used which define and describe the functioning of any organization. One of the most serious information problems is the lack of information flow through the communication networks. Successful companies use horizontal communication (information shared among peers) to coordinate work and to solve problems. The actual communication system within an organization is becoming an increasingly powerful determinant of its overall effectiveness.

The researcher asked specific questions to find out how open communication is within the company and to find out what barriers may or may not exist in sharing information required to solve problems and make decisions. The Business Development
Specialists Internal work stations were set up in open cubicles (with their own desk, telephone and desktop computer) in one large room. The researcher observed that BSDIs were at their desks and on the telephone for most of the day; however, the BSDIs also communicated daily to support each other with any technical problems or questions or to help resolve a customer issue. There was a wide range of experience within the staff group so many of the more recently hired people also turned to peers for information about the business. The number of internal people the BSDIs said they spoke to differed according to the number of people employed on-site in the office. All BSDIs regularly communicated with their BSDE partner and their BSDI colleagues.

Seventy-five per cent (75%) of the respondents said that the implementation of Goldmine had not changed the communication patterns on the job. However, twenty-five per cent (25%) of the respondents said that they now had more contact since the implementation of Goldmine. This response was principally from Business Development Specialists External. Before the adoption of computer technology, the BSDEs worked in the field on their own and communicated infrequently with others. With the restructuring of the sales function, almost every BSDE had an internal partner with whom they communicated at least once daily.

**Communication in the Hierarchy**

In summary, sixty-one per cent (61%) of the respondents said that they received more information and direction from management than they forwarded up. Thirty-nine per cent (39%) of the respondents stated that information flow was two-way, both up and down within the organizational structure.
The interview question, "Do you send more information to management than you receive?" was somewhat ambiguous since it did not specify the type of information being communicated. The managers forwarded many internal information interest items to employees on a regular basis which may not have required a response, e.g., changes in government regulations and tariffs, competitor information and relevant articles in publications. Respondents stated that they had open communication with their managers and were comfortable to ask questions and request information as required to do their job and therefore considered the information flow to be two-way in nature.

The researcher also asked whether or not the BDSs would consider bypassing their immediate supervisor to get an answer to a question that they had. This question was asked to determine the communication channels within the organizational hierarchy that the staff perceived and to solicit more information about the bureaucracy of the company (and how that had an impact on information flow). Information technology facilitates the free-flow of information at all levels of the organization and can support the bypass of levels of management.

The question was interpreted in different ways by the respondents. For example, it was not unusual for Business Development Specialists to communicate with the management level staff in the service department without consulting with their own immediate manager. However, this was a common practice and was not considered "bypassing" their supervisor.

It was also not unusual for Business Development Specialists to consult with senior management (the immediate manager’s supervisor) for questions about large customer accounts or complex situations. Most Business Development Specialists stated
that they would inform their immediate manager about any discussions where this occurred.

General consensus was that the Business Development Specialists would go to their immediate supervisor first to discuss an important question and involve him or her before moving up a level in the hierarchy. The only time that they could foresee bypassing the supervisor was when he or she was unavailable and the question required an immediate response.

*Communication Across Departments*

The literature cites many examples where departments within an organization are kept quite discrete and the role of the manager is to liaise between departments on behalf of the employees he/she supervises (Pateman, 1970; Rieger, 1995; Iannello, 1992). In these companies information is communicated through the manager to other departments and feedback from other departments is received through the manager. A question was asked to ascertain the level of communication relevant to performing the sales job permitted across departments.

Eighty-nine per cent (89%) of the respondents said that they had *daily* communication with other departments, particularly operations (service). The remaining eleven per cent (11%) of the respondents had a minimum of *weekly* communication. There was absolutely no concern expressed about going to a person at the same level or a manager in another department in order to serve the customer. Cross-department communication was an expectation of the job and the cross-department relationships were considered to be very important to job success.
The researcher also asked the respondents if there were individuals in the organization who possessed information which they needed to do their job who refused to share that information. The majority of the respondents (sixty-four per cent) answered "no" to this question. They did not feel that there were people who intentionally did not or could not share information. The consensus across branches was that individuals would not intentionally withhold information; however, respondents stated that the individuals who had the information seldom initiated in forwarding it to the sales group. From the perspective of the Business Development Specialists, getting the information was often a matter of asking the right question of the right person. The national company in this study was quite large, with 2,400 employees, and had experienced significant staff turnover in the last two years. Respondents stated that a barrier to getting information that they needed to do their job quickly and easily was knowing who to ask, as with all of the staff changes, they no longer had a familiar contact. The majority of respondents agreed that once the information was requested from the person who possessed the answers, the person would willingly share it.

4.6 Decision-making

Decision-making is the central activity of any organization. Employee involvement and influence in making decisions can be seen as existing on a continuum. At one end there is management with total responsibility for all decisions, telling non-managerial employees what to do. This autocratic or authoritarian decision-making process does not involve any interaction or communication among employees prior to decisions being made. At the other end of the continuum there are non-managerial
employees making all the final decisions. In the middle of the continuum is a consultative management process where management and employees communicate issues and participate in joint problem solving. The consultative model utilizes the expertise and creativity of the employees in solving managerial problems and subordinates are actively involved in important decision processes of the organization, not just in tangential concerns.

Organizations make a wide range of decisions, from strategic direction and finance to day-to-day operations. A number of studies of workplaces have shown that individuals have a desire to influence decisions about their own job (Kaplan, 1993; Dumaine, 1990; Moad, 1997; Pearson, 1992). Decisions about how the job should be done are best made by the person doing the job as he/she has the information and first-hand knowledge required to make decisions. Information technology offers opportunities for decentralizing information so that employees may make more decisions about how and when they do their own jobs.

The research question in this case study asked what the impact of technology (changing the context of the work) is on decision-making in the workplace. The following interview questions were asked to find out how Business Development Specialists (and managers) perceived their involvement in decision-making since the introduction of technology.

Describe the way decisions are typically made in this company.

There was a wide range of answers to this survey question. Some respondents stated, "I don’t know", "I wish I knew", "Top-down", "You don’t have a lot of input at front-line" and "You are told about the decision after the fact". On the other hand, several
respondents stated, "There is input from every department in consultation", "Suggestions more times than not are heard for smaller decisions", "Management does meet often and decisions are made in committee". The overall comments indicated to the researcher that the majority of company-wide and strategic decisions were considered to be top-down (from head office senior executive group). Generally, respondents felt that a consultative approach was used, albeit inconsistently, for day-to-day operational decisions.

The managers who were interviewed described the organization as relatively flat without a lot of levels of hierarchy. One manager described decisions as typically made "through the assigned activities of pilot teams which assess options and decide final outcomes by consensus". Other managers described decisions as top down from head office (similar to BDS responses) and commented that increased communication and feedback would be desirable. For example, each manager was told what the regional sales targets would be without a lot of opportunity to discuss the different marketplace pressures across the country or negotiate the expected outcomes.

An interesting note is that the company was sold in the middle of October during the research interviews. On the day the deal closed the Business Development Specialists, without any prior knowledge that a sale of the company was planned, were notified by voice mail that there was a new owner. This caused some anxiety to be expressed to the researcher about the possible impacts on jobs (and some suspicion about the researcher’s untimely presence and work-related interview questions).

**What information do you need to make decisions in your job and where do you get it?**

The most common answer for respondents with years of industry experience and
longer tenure with the company was “past experience” and “my personal knowledge base”. All respondents spoke about getting as much information as possible from the customer in order to make an informed decision about what business to follow and what software solutions to promote.

Respondents also turned to company resources to seek out the information they needed to make decisions. The kinds of resources people referred to were predominantly human resources (including colleagues, supervisors, service department personnel) and technological resources (competitor information, rates, company literature, customer profiles) which were immediately available on their personal computers. In addition, respondents also referred to newspapers, journals, Internet sites, bulletins and information about market trends to help justify their decisions in a labour context.

**What decisions on your job do you make completely on your own?**

Introducing computer technology to the sales group increased the opportunity for autonomy and self-direction in carrying out the work for the company. Employees did their work with a minimum of interference and they were expected to seek out help when they needed it. The researcher found a generally positive response to the question about what decisions they made completely on their own although there were some mixed reactions. Some individuals commented, “Pretty well everything” or “I am basically independent” and others stated, “There are very few significant things that I can do that I don’t have to go out of my own area of responsibility to ask approval” and “Not too many. My daily schedule and when to make phone calls, but everything else I’m told what to do”.

When the company introduced the computer technology it also put into place specific guidelines for doing the work. The guidelines included company expectations for the number of telephone calls or visits to be made on a daily and weekly basis and requirements for weekly reports documenting the work. Structures were also put into place allowing BDSs to make their own decisions about rates to quote within specific parameters. The technology provided the rate structure and automatically calculated the quotes. The respondent reaction to the new structure and guidelines introduced with the personal computer was varied. Respondents made the following statements:

"We are given a lot of leeway but there is a limit",

"There is more structure since Goldmine so it is different [from before]",

"Making decisions themselves haven't changed...we were always given targets",

"The daily decisions have nothing to do with the personal computer", and

"Decisions haven't changed, it is based on management style how much latitude I have".

It is the observation of the researcher that the guidelines and structures (and new expectations) that were introduced as part of the redesign of the work introduced standardization and consistency. However, this gave some employees the impression that they had less autonomy than they had experienced before the introduction of personal computers.

There were three common decision areas that respondents described as completely within their own purview: the daily schedule, the flexible workplace and sales decisions within the company guidelines. The researcher asked each Business Development Specialist to describe a typical work day. All respondents reported that they chose what their activities were, chose when to do them and chose how to accomplish those tasks.
For example, some BDSs made all of their telephone calls to new suspects first thing in the morning, others did all follow-up work from the day before. Some BDSs chose certain days of the week to accomplish specific tasks. Each person had organized his or her own schedule and timelines in a manner that he or she preferred. The Business Development Specialist decided who he or she would call, which business to pursue and which software solutions to sell to that customer for what price. Several people mentioned the entrepreneurial role of "managing their own territory like a business".

As mentioned earlier in the findings, with the introduction of personal computers came the opportunity for Business Development Specialists External to work from home on a full-time basis (termed "telecommuting"). Maintaining daily electronic contact with the BDSI partner was built into the company expectations as part of the new way to work. Most BDSEs continued to make telephone contact in addition to the daily computer synchronization by modem. A couple of the Business Development Specialists Internal in different parts of the country also expressed interest in the opportunity to work from home (with continued communication with their partner).

All respondents reported that they could make decisions on their own on which business to pursue within their territory and what price to quote within the pricing structure. Several respondents also stated that they were comfortable personally deciding to slightly "stretch" the price outside the parameters if they could rationalize the decision to their supervisor.

All three regions had a training budget (for workshops, courses, conferences) and an expense budget (for mileage, hotels, trade shows). In the West region the researcher was advised that each BDSI/BDSE team was responsible for its own budget to be used in
its territory. Budgets included training, expenses and purchases. Each team in the West was asked to submit an annual budget for their territory to the manager and once approved, they administered it on their own.

**What kind of decisions do you consult with your manager about?**

There was general consistency in responses to this question across the country. Of course, each salesperson had a preferred working style. For example, some preferred to work more independently than others based on their experience and confidence in the position. The overall comments were divided into three main theme areas: exceptional rates requiring management approval, complex situations (internal and external) and advice and expertise.

*Exceptional Rates*

Before the adoption of computer technology and the restructuring of the job, every customer who was signed up had to have a manager’s signature. With the work redesign, Business Development Specialists were permitted to decide to “sign up” a customer or not within specific rate parameters. All respondents stated that they had to consult with their manager to justify a different rate if it fell outside the predetermined rate structure.

*Complex Situations*

When asked how they solved a problem, the majority of respondents replied that they tried to solve it themselves. This meant personally contacting another department or working through the problem with the customer. Since they were not expected to go through their immediate supervisor to communicate with a manager in another department, the sales people in the company had the freedom to openly communicate with other departments at any time. However, if the problem could not be resolved
individually, respondents reported that they would then take the problem to the manager for consultation and support. On occasion, the manager was asked to speak to a higher level person within another department in the company or to intervene with the customer in unusual circumstances on behalf of the BDSs.

Information and Resource

When the company redesigned the workforce, several new staff were hired. Many of the more recently hired staff said that they consulted with the manager for information and advice, not necessarily a decision. The consultation was with regard to what sales approach to use, assistance in preparing a multi-media presentation, or what business to “give up” on. Managers had the role of “coach” and “facilitator” and provided a liaison function between the front-line staff and top administration.

When the managers were asked, “Do you think you, as a manager, are consulted by staff more/less/same as before the implementation of computer technology?”, all three responded that they were consulted the same as before but it was for higher level decisions. One manager said that efforts were made to intentionally hire people who demonstrated “autonomy, independence and initiative” and were willing to be responsible for their own decisions. He expected his employees to consult with him about unresolved problems or to request suggestions on selling strategies. A second manager advised that the staff primarily consulted with him about business strategies or approaches, not day-to-day decisions about how they did their work. The third manager made a similar statement when he said, “Staff are further along in decision-making than at the infancy stage”, and he had asked them to consult with him on business plans they had prepared themselves specifying their own planned approach to segmented markets in
The managers were asked directly, **Do you think that the introduction of computer technology has changed the level at which decisions are made in the organization? Do you think your staff members make more decisions on their own than before Goldmine was introduced?** Two managers responded **yes** to these questions and one said **no**. One who said “yes” explained that the staff had “more empowerment” than before the introduction of technology. Another said “Yes, the introduction of technology and a higher level of training and rationale for decision-making as well as training about the profitability of sales has been supported by technology” and “It has also put people out in the field making decisions”. The manager who answered “no” to this question stated that “The staff already had a lot of room for decisions [on their own]” and the technology had not impacted on this one way or another.

The findings are consistent with the literature in describing traditional management structures and decision-making. The strategic decisions impacting the organization’s survival and growth are made at the senior management level. Lower level operational decisions impacting the day-to-day work are delegated to the subordinate positions. In this company decisions continued to be highly centralized at the top of the hierarchy with limited input or discussion with the people expected to implement the decisions. The information technology was not used to decentralize the organization or to devolve decisions to front-line workers. Employees had some control over decisions about their own job and work schedules but they were not involved in using their expertise to jointly problem-solve with management about strategic company decisions.
4.7 Job Autonomy

Terms such as job satisfaction, job attitudes and job motivation are often used interchangeably to describe internal psychological states. These states are typically measured through interviews with workers who are asked to state the degree to which they like or dislike their job. There has been little standardization of job satisfaction measures in the research (Vroom, 1967). Hackman and Oldham (1980) describe three internal psychological states critical to motivation at work: 1) experienced meaningfulness of the work, 2) experienced responsibility for outcomes of the work and 3) knowledge of the actual results of the work activities. Internal psychological states are not directly manipulable in designing work. Hackman and Oldham researched and developed an instrument called The Job Diagnostic Survey to measure properties of work that affect these internal states. Within their model the job characteristic that fosters increased feelings of personal responsibility for the outcome of the work is termed "job autonomy".

According to Hackman and Oldham (1980, p. 79), autonomy is defined as:

The degree to which the job provides substantial freedom, independence, and discretion to the individual in scheduling the work and in determining the procedures to be used in carrying it out.

The literature supports the concept that when employees have more control over their work lives by having a say about when, where and how they will get their work done that they will be more loyal, more committed and more productive (Capowski, 1996). This is termed "vertically loading the job". "Workers are given increased control over the work by 'pushing down' responsibility and authority that formerly were reserved for
higher levels of management. In effect, the gap between the doing and the controlling parts of the work is narrowed” (Hackman & Oldham, 1980, p. 138). Autonomy increases when employees can set their own schedules, determine their own work methods and make their own decisions on assigning priorities to what must get done. Autonomy also increases when employees are encouraged to seek solutions to problems on their own or to consult with colleagues before taking the problem to their supervisor. When the job provides autonomy, the work outcomes are viewed by the employees as a result of their own efforts and decisions rather than as a result of directives from the boss or from a manual of procedures. Experienced responsibility for work increases internal work motivation.

As discussed, one of the critical factors in decision-making is feeling personal responsibility for the work, that is, feeling free to make decisions on your own. A written questionnaire with questions pertaining to “autonomy” from the Job Diagnostic Survey and additional questions developed by the researcher pertaining to general job satisfaction were administered to the eighteen individuals from Central region who were interviewed face-to-face. The Job Diagnostic Survey (JDS) was used as a data collection instrument to evaluate the effects of work redesign by finding out how much the job had changed and what effect this had on employee satisfaction. The JDS has been used extensively in research and scored across 876 different jobs. The means and standard deviations can be used to determine if the job characteristics are out of line with national norms. If the autonomy scores are (plus or minus) two or more standard deviations away from the normative mean, it suggests that action to improve may be appropriate.
### Table III

**Job Diagnostic Survey Means and Standard Deviations for Job Families**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Professional or Technical</th>
<th>Managerial</th>
<th>Sales</th>
<th>Company Score</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Autonomy</td>
<td>5.4</td>
<td>1.0</td>
<td>5.4</td>
<td>.92</td>
</tr>
</tbody>
</table>

**Note.** The company score is more than one but less than two standard deviations below the norm for the job occupation of *Sales*. From “JDS Normative Data for Several Job Families” by Hackman R., and Oldham, G., 1980, *Work Redesign*, Appendix E.
The Job Diagnostic Survey normative data for the job characteristic of “Autonomy” in the occupation of Sales reflects a mean score of 4.8 with a standard deviation of 1.4 (see Table III). The overall average scores from the eighteen Business Development Specialists who were administered the Autonomy portion of the JDS survey at the company in the case study was a mean score of 3.3. If the job scores are less than one standard deviation away from the normative mean it is considered to be an insignificant difference. The company score was slightly more than one but less than two standard deviations below the norm. This score indicates that the Business Development Specialists who completed the survey viewed their jobs as slightly lower than the norm for experienced responsibility for work outcomes.

Since this test was administered at only one point in time, it is not known whether this score reflects an improvement towards the norm since the introduction of computer technology, or if the score indicates that the sales employees are feeling less work autonomy and have moved below the norm over the last two years.

The second part of the questionnaire included questions about job satisfaction (developed by the researcher) with ranking from a low score of 1 (extremely dissatisfied) to a high score of 7 (extremely satisfied). Although the JDS Autonomy score was 3.3, the average score for general job satisfaction from all respondents was 6.0 for “Satisfied”.

It is concluded from these findings that the basic job of the Business Development Specialists was not well designed in the area of job autonomy. It is suggested that allowing the BDSs to participate more in the areas of choosing territories and partners, choosing how to conduct work in them, negotiating sales targets and using the technology
to manage workflow may be considered for future redesign efforts. These steps may improve the perception of job autonomy and experienced responsibility for the outcomes of the work by employees, thereby increasing the Job Diagnostic Survey scores.

4.8 Summary Discussion of the Findings

The purpose of the research was to explore the impact of the introduction of information technology on decision-making and job autonomy experienced by employees in an existing company. In the following section, the four main research questions that were investigated will be addressed.

1) What changes in the work environment and job are perceived to be the result of introducing information technology?

The introduction of technology was the catalyst for dramatic and radical changes in both the work environment and individual jobs as the company modernized the workplace for its own survival. The participants in this study moved from a completely paper-based, non-technological work environment with administrative staff to provide support functions in 1995 to a completely computerized work environment using technology to provide support functions in 1996. The company introduced information technology as a support tool for the newly created strictly selling role of “Business Development Specialist”. The technology was used to provide valuable suspect and territory information that was instantly accessible electronically. The information technology was used to organize and track customer contact and activities as well as provide a detailed schedule of work for each employee. It was also introduced as a tool to demonstrate new services that the company was offering as it provided the ability to do
hands-on multi-media presentations at the customer site. After two years of implementation, the company demonstrated positive outcomes in productivity and increased sales revenues.

The views of the respondents were consistent across the country about the positive impact technology had on their jobs. Their comments addressed increased efficiency in doing the job, better time-management and organizational skills, increased productivity, feelings of being more professional and having a better competitive edge. They stated that technology made doing the job easier. The information technology had enriched the job and increased the job quality by changing the duties and broadening the skill set of the employees.

The respondents also concluded that the technology had brought increased demands to the job, longer hours, additional paperwork and detailed management supervision of the work through daily report requirements. Very specific guidelines for doing the job and limitations for making decisions within specified levels of responsibility were also introduced when the company computerized. Research studies have found that the degree of choice individuals have regarding the methods they utilize in doing their work increases satisfaction and decreases job stress. Although the employees in this firm spoke about control over their daily schedule and routines, they expressed a lack of control over the number of additional demands they were experiencing in what service (product) to promote, where to promote it (territory), who they had to work with and how they documented their work.
2) What impact has information technology had on access to company information and on communication processes used by employees?

The key function of the Business Development Specialists was to “sell, sell, sell”. Introducing personal computers to each sales person, allowing them to immediately access abundant information about their territory including every business name, competitor information, current rates, mail lists, and so on had a demonstrable impact. Although this information had been available in the past, it was readily accessible and easily retrieved using information technology. The sales person could concentrate on the core job function of selling as he/she no longer had to research information through business directories, libraries and filing cabinets.

Information was also available on the company wide area network called Locus. Very few people in this study accessed information through Locus for a couple of reasons:

1) it was considered an operational tool irrelevant to sales, and 2) access was limited due to password restrictions to sensitive company information.

Information technology had a limited impact on communication processes in this company. Voice mail, informal conversation and written memoranda continued to be the predominant methods of communication. However, the Business Development Specialists External showed an increase in how often they were communicating (usually daily with an internal partner) and the detail of information they were communicating (with transfer of all activities recorded on the personal computer through daily synchronization by modem). Electronic mail had limited use in the company.
Communication with the manager through the organizational hierarchy or across departments was not impacted directly by the technology. An indirect result of the work redesign was increased communication between the sales and service departments because the Business Development Specialist job had changed from sales and service to strictly sales, so customer concerns were now forwarded to the service personnel. Similarly, if service personnel had been working with an existing customer they would sometimes identify further sales opportunities and make recommendations to the BDSs.

3) What are the employees’ perceptions of decision-making within their job since the adoption of computerization?

The overall results of the case study provide inconclusive support for the idea discussed in the literature that information technology decentralizes decision-making. Respondents were consistent in describing the decisions they make completely on their own including their daily schedule, who to contact and how to formulate the sales approach. The one decision moved down from management was that the BDSs could now approve new customers within specific rating structures and pricing parameters available on their personal computers. The technology provided quick and easy access to information required to inform all of the above decisions. Sales employees who had more than a two-year tenure with the company suggested that the kinds of decisions being made in the job had not changed significantly with regard to the daily work with the exception of being permitted to remain off-site for several days.

Decisions continued to be top-down with limited consultation from the employees doing the job. The company typically utilized pilot project teams to test out new ideas.
The researcher observed that this testing was for refining the implementation or company roll-out of a decision already made by senior administration, not for consultation purposes.

With the introduction of technology the company also introduced more rigid standards and procedures and increased expectations for productivity. Management used the technology to further centralize information and monitor the daily work of the sales staff. For example, a specified number of daily telephone calls to potential customers was prescribed by management who used the technology to monitor performance. The Business Development Specialists External stated that they had experienced less rigidity and fewer paperwork requirements before information technology was incorporated into the job.

4) What are the employees’ perceptions of job autonomy and job satisfaction since the adoption of computerization?

The amount of job autonomy perceived by the employees was slightly below global norms. Half of the respondents now worked out of their home and had more job autonomy with respect to their workplace environment. However, the technology also introduced more stringent work processes and detailed statistical data requirements. Administrative responsibilities became part of the job function as a result of computerization. Additional reports and information gathering were added on to the daily work requirements.

A common concern expressed by the respondents was dependency on the computer to perform the job. Participants in the study expressed anxiety about their total
reliance on their laptop. One person said, "My whole job revolves around that thing". This feeling of loss of control may have contributed to lower perceptions of job autonomy.

From the perspective of the people who were the direct recipients of the restructuring of the job and the job functions, there were some significant improvements in job quality. People considered the personal computers to be "amazing tools" to keep them focused, on track, organized, effective and efficient. Contrary to contentions in the literature that computerization negatively impacts employee attitudes, the computer usage was positively correlated with general satisfaction with the job.

4.9 Recommendations

The company that was used to research the impact of information technology on decision-making had a strong vision which was effectively communicated and commonly understood by the employees. The company invested millions of dollars in the hardware, software, technical support and training to ensure the vision was realized. The technology was introduced through two to three weeks of comprehensive training including well-defined methods and clear expectations for specific behaviour change on the part of the employees. The initial results were impressive. Productivity in sales dramatically increased and sales revenues reached new levels. However, with the introduction of the information technology there was a fifty per cent staff turnover and the new recruits understood sales but had to learn about the business. By the third quarter it also became apparent that the company was losing as many customers as it was gaining. With the
“sell, sell, sell” vision, long-standing customer relationships were lost and they were choosing to take their business elsewhere.

As an unbiased outside observer I had the luxury to examine what was happening in the company through the eyes of its employees. During the research I realized that the company managed the technical aspect of the introduction of technology and automated work processes very well. However, it completely underestimated the impact of technology on the social aspect of the job and therefore underutilized the capacity of the technology to improve the quality of working life for its employees. If I were a senior manager in this company I would implement the following recommendations:

1. **Involve Employees in Management Level Decisions that Directly Impact Their Work**

   There was no change in management philosophy with the introduction of the computer technology. The entire redesign of the work was handed down from the top as a directive and implemented in a traditional “command and control” format. The habits and views of management did not change with the new vision and company objectives. In their redesigned jobs, Business Development Specialists were given new equipment with instructions for mandatory use, assigned territories to work in, assigned sales targets, assigned working partners and new responsibilities for performing all administrative tasks required to support their own work.

   Ultimately, the authority for final decisions rests with management. However, the opportunity to discuss the unique idiosyncrasies of the territories that employees are expected to work in may provide vital information to management that would impact decisions about sales targets and the skills and experiences of the individuals employed in
that territory. Respondents suggested that it was important for management to talk to people in the field (and occasionally visit the field) to get a holistic picture verified by staff experiences, and to gather information beyond numbers and statistical reports to make better informed management level decisions. This concurs with Anthony (1978) who advises that sales personnel can be a major source of information about the environment for the organization. They should be viewed as a two-way communication link, both selling to the customer and providing evaluative feedback on how the company is doing in meeting customer needs.

Sales personnel know the market and the customers. The organizational management literature suggests that employees are more likely to implement a decision that they help to make. The Business Development Specialists should have substantial input into the sales approach most appropriate for their area (be it downtown Toronto or northern British Columbia) and should be mutually setting sales targets with management based on this knowledge. Sales people should also have input into the budget and resource allocations required to do their job on an annual basis. This budget development would include costs for training, trade shows, travel allowances and so on.

The two newly assigned partners work together on a daily basis. They share every aspect of the work, including the remuneration. It is imperative that the teams work well together to be as productive as possible. Partners should be involved in the process of hiring and orienting their “mate”. Ongoing training in team building, conflict management and team work should be incorporated into professional development activities throughout the year.
2. **Ensure On-going Training**

Employees were expected to completely change years of work habits with one-time intense training for three weeks. This did not support employees to utilize the existing technology to its full capacity. Many people spoke about their hands-on “trial and error” learning with little formal direction. A strong request from respondents was to participate in six-month refresher courses and advanced techniques courses in *Goldmine* (and other software programs) so that all staff could better utilize the existing technology.

The company had an obvious commitment to training and continuous learning in the areas of product information and customs brokerage. Employees were taught the technical skills to use the new equipment but they were not taught the social skills required to make the new work arrangements fully successful. New work behaviour, skills and attitudes are required in a redesigned work setting. The vision and goals require frequent revisiting to ensure everyone is working together in the best interests of the organization. Team-building activities and organized opportunities for face-to-face contact need to be structured into the new workplace to reaffirm the newly acquired skills, working relationships and attitudes. It would also serve to reduce the isolation and dehumanization factors that respondents associated with the use of technology.

3. **Increase/Improve Communication Through the Use of Technology**

The change to the use of information technology was introduced throughout the sales department as a tool to automate the sales process. The intent was to increase productivity and sales revenues. Management used the information that was generated through the technology to more closely monitor the performance of the sales personnel...
and to track statistical data according to specific territories and product releases.

Each Business Development Specialist had a personal computer with electronic mail capability (although it was limited to users within their own region). However, it was not an expectation of management in the redesign of the work that employees communicate in a way different from before the introduction of the technology. In fact, there were limitations built into the software which restricted access to other departments and other branches. In addition, management did not model use of the technology in communicating with staff, the managers continued to use voice mail and paper correspondence to forward information and requests. There were several suggestions made by respondents for better utilizing the existing technology and for possible upgrades that would be beneficial to the key job functions of the Business Development Specialists.

The suggestions included such things as:

a) increased use of electronic mail to share information within the company,

b) external access to LOCUS,

c) internal access to other departments (especially service) and across branches to GOLDMINE,

d) use capacity of GOLDMINE to fax directly from the personal computer,

e) Internet access for all BSDIs and BSDEs, and

f) electronic transmission of newsletters, memos, journal articles.
People need to communicate with others to do their work effectively. The work needs to be organized in such a way that the jobs within and across departments are complementary to each other. Respondents expressed a lot of frustration with their limited ability to share information with one another. Employees need discretion and control over their own work to best utilize their knowledge and skills and they need to communicate with their colleagues to further develop their abilities.
Chapter 5: Conclusion

Information technology can be seen as providing an opportunity to enrich jobs and decentralize decision-making to the person who is doing the job. It is possible for management to amplify this opportunity through training and by changing policies and structures in the organization. Management may also negate the opportunities offered through information technology by imposing strict guidelines in the processes for how to use the technology or by not utilizing its potential to ensure two-way communication and information-sharing to generate bottom-up recommendations. The premise here is that, while technology can and does act as a facilitator or enabler for more autonomous work and independent decision-making, it does not determine changes in the methods of decision-making or decentralization of work.

This research corroborates the works of Buchanan & Boddy (1983), Robey (1977), Menzies (1982) and Blackler & Brown, (1985). In their research of seven different companies that introduced technology, Buchanan & Boddy concluded that the technology created the opportunity for improving the quality of working life, but it depended on how management chose to organize the work. Robey found that computerized systems may facilitate either centralized or decentralized structures and the degree of delegation is related to the environmental conditions of the organizations studied. The current study had similar results in that the quality of working life improved and management utilized the technology to further centralize decisions and to monitor work performance. Menzies found that technology reduced the number of low-skilled jobs and eliminated clerical functions. In the current study, all of the newly hired people
had a university education (unlike the previously hired employees) and the clerical functions were added on to the sales peoples jobs through the use of technology. Blackler and Brown concluded that the emphasis on technology disregards the social systems and supports an antagonistic view of participation in decision-making. In the current study, technology was introduced to increase productivity and revenues for the company. The sales employees were mandated to use the new technology with little consideration for the impact on relationships or social context of the job.

All of these studies findings suggest that computerization plays a neutral role in moving decision-making to lower levels. The introduction of new technology facilitates opportunities to make other organizational changes complementary to the new work processes and redesign of the job, but whether or not those changes are made depends on the future vision, policies and will of the company leaders. As Blackler and Brown state, “There is an important need to seek to influence opinion and practice to ensure that the technologies are used to increase peoples’ opportunities for self-determination at work rather than simply to seek for ways in which the new technologies can be smoothly introduced” (1985, p. 213). Company management must structurally and politically support the behavioural change required by employees and reinforce the new skills and job functions with new operating styles, organizational structures and policies in order to facilitate the devolution of decision-making to lower levels.

Sociotechnical systems design theory emphasizes the redesign of the workplace to promote responsibility and control over the work. This may be accomplished through increased access to information and participation in decisions that affect the individual and the workplace. The difficulties expressed by the participants in this case study
illustrate that introducing new technology and new tasks, while leaving the organization’s hierarchical structure intact, continues to reinforce past practices of external control and centralized decision-making. The introduction of technology stressed the use of partners at the sales level but not in any other areas of the company. The jobs of managers and office personnel were changed because they were now working alongside two-person teams; however, they were not themselves in a team structure. This inconsistency had reduced the effectiveness of the redesign initiative. The impact of the technical system on the organizational environment was clearly underestimated in this company.

In work redesign initiatives organizational learning must go beyond training in the use of the technology to be truly successful. An approach to organizational change that emphasizes classroom training for learning technical competence alone is not sufficient for complex organizations. The social-psychological aspects of the restructuring of the workplace must be incorporated into the design for optimal results. McGill and Slocum (1992) describe the majority of companies as continuing to cope in an “adaptive” mode. They define this as an organization (and individuals) who focus on incremental improvements, often based on long-standing practices from success in a previous time period and previous competitive environment. “For firms that cannot break the adaptive learning habit, changing technologies, fragmentation of market demand, and new organizational forms hasten decline and resignation” (McGill & Slocum, 1992, p. 6). This emphasizes the need to educate people at all levels of the organization on the impact of a technological innovation on organizational structure, organizational culture, work processes and the roles of both management and staff in decision-making. A system for continuous learning based on actual on-the-job experiences is required. This facilitates a
dynamic process of emergent learning as unexpected issues arise or further refinements are introduced over time.

The current study has particular implications for individual and organizational learning in a work context. The restructured work environment demanded that employees learn entirely new skills to keep their jobs and remain in the workplace. The work redesign also demanded that employees learn new work processes and interactive skills to communicate with their peers and their immediate supervisor. Management focused on designing the most effective organization for the future of the company and envisioned the change as a procedural event. In order for the change to be successful, careful design is required of the transition state of moving from “what was” to “what will be”. In this case study almost half of the original workforce were unable to manage the demands of technological change and left the company.

Although it is possible to identify ways that information technology may improve the quality of working life, there is no guarantee that it will be used that way. There are choices in how the technology is implemented and these choices influence the eventual impact of the technical changes on the organization and its employees. Information technology enables change in organizational structure and management, it does not cause it. For example, some managers may use the technology to enforce a clear chain of command, limit information exchange by blocking certain channels of communication and exert increased control through the computerized analyses of sales. The very same technology may be used by other managers to support information sharing and participation in problem-solving, the delegation of tasks and employee participation in decision-making and to create dynamic work processes that build expertise and
knowledge at all levels of the workforce (Sproull & Kiesler, 1992).

5.1 The Need for Future Study

This dissertation concentrated on the impact of technological change in the job on decision-making and job autonomy experienced by employees. The research was conducted in the context of an existing corporation. It illustrated some of the challenges and dynamics that companies must face in the restructuring of the workplace in the nineties and beyond.

Although there has been some research on work redesign, there is limited research on the impact of information technology. The study indicates the need to emphasize learning in areas such as problem-solving, communication, decision-making and control at all levels of the organization. Social science has an important role to play in the development of psychological and social priorities that are raised by the introduction of technology, particularly in the management of change in the workplace. The contribution offered by the current research highlights the importance for including the redesign elements of a restructured workplace beyond the physical plant and technical change to include decision-making and consideration of job autonomy, and the processes through which new systems are introduced.

The data are drawn from one specific company; however, the issues identified may also be relevant to other organizations. Further research in other types of organizations and the public sector could prove extremely valuable in designing future change efforts and in constructing the learning outcomes for all levels of the organization. Psychological and social issues raised by the new technology need to receive as much
attention in the research as productivity and economic efficiencies. It is hoped that the results of this research contribute to a better understanding of work redesign processes and assist in the development and implementation of future change efforts in workplace settings.
REFERENCES


Moad, J. (1997). Dupont’s people deal. PC Week, 14, 75-78.


Appendix A: Agreement to Participate

AGREEMENT TO PARTICIPATE IN RESEARCH FORM

I, ______________________ hereby consent to participate as a subject in the research study entitled: The impact of information technology on decision-making in a workplace environment.

I understand that Patti Reed is a doctoral student at the Ontario Institute for Studies in Education of the University of Toronto. She will be conducting a one-hour, semi-structured private interview with me. Names and identities will not be attached to any comments or reports of the study. Findings of the study will be made available to me on request.

I agree to proceed on the understanding that I may withdraw from the study at any time, without reason. Should I wish to withdraw, it will only be known to the researcher, not my employer.

I understand that I am not placed under any risk and that reasonable safeguards have been taken to maintain confidentiality and to minimize any potential problems.

Signed ______________________
employee's signature

Date ______________________

Signed ______________________
researcher's signature
Appendix B: Business Development Specialists Interview Questions

USER QUESTIONNAIRE

Researcher Code #

1. Name of User:
   Division/Department:
   Job Location:
   Territory:
   Interview Date:

2. a) Title of position ____________________ Telephone #____________
   b) Gender
      i) male
      ii) female

3. Job Category
   i) business development specialist - internal
   ii) business development specialist - external
   iii) business development manager

4. Education
   i) high school or less
   ii) community college or technical school
   iii) university

5. Length of time with this company:
   i) less than 12 months
   ii) 12 months to 24 months
   iii) 25 months to 36 months
   iv) 37 months to 5 years
   v) 5 years or more

6. Length of time in customs brokerage business?
   i) less than 12 months
   ii) 12 months to 24 months
   iii) 25 months to 36 months
   iv) 37 months to 5 years
   v) 5 years or more

7. Length of time in current position:
   i) less than 12 months
   ii) 13 months to 24 months
   iii) 25 months or more
8. Please describe the key functions and responsibilities of your job.

9. How has your work been affected by the introduction of computer technology?

10. In a typical week, how many hours of your work time do you spend using the computer?
   i) 10 or less hours
   ii) 11 - 20 hours
   iii) 21 to 30 hours
   iv) more than 30 hours

11. As it stands now, is it possible to do your job without using the computer? That is, could you carry out your current duties and responsibilities if you no longer personally had a computer?
   i) yes, it could be done
   ii) no, parts of my job require personal use of the computer
   iii) technically possible, but would not have time to accomplish all my work

12. Do you believe that the implementation of Goldmine* has had an impact on the quantity of work that you do?
   i) yes, large decrease
   ii) yes, moderate decrease
   iii) slight decrease
   iv) no change
   v) yes, slight increase
   vi) yes, moderate increase
   vii) yes, large increase
   Please elaborate.

13. Do you believe that the implementation of Goldmine has had an impact on the quality of work that you do?
   i) yes, large decrease
   ii) yes, moderate decrease
   iii) slight decrease
   iv) no change
   v) slight increase
   vi) moderate increase
   vii) large increase
   Please elaborate.
14. When the technology was implemented, how much training was provided?
   i) none at all
   ii) training on basic features
   iii) additional training on higher level features
   iv) training and education beyond computer use

   Did you consider the amount of training to be sufficient?

15. When the new technology was implemented were there any changes made to your job duties, responsibilities, how your job was organized, or your behaviour in the job in comparison to your job prior to receiving the technology?
   i) yes
   ii) no
   iii) not applicable, this was a new job for me

   If yes or no, please elaborate.

16. Do you have access to ongoing support in the use of the technology?
   Do you consider the amount of support to be sufficient?

17. Were any kind of specific objectives established prior to the implementation of the technology (i.e. cost savings, productivity increases)?
   If yes, what were they?
   Who set the objectives?

18. Is there a clearly defined methodology in how to do your job?

19. Describe the major tasks you do in a typical day.
   How many of the tasks in your job are the same from day to day?
   i) very few
   ii) some
   iii) most
   iv) almost all

20. How do you find out new information within your company?

21. What kind of information that is generated by the computer do you access to do your job? Please describe.

22. Do you now have access to information relevant to your job that you did not have prior to the new technology?
23. Think about a regular day. How many internal people do you regularly communicate with on your job on a daily basis? Is this the same or different from before the implementation of Goldmine?

24. Are more than 50% of your contacts in the formal organizational structure primarily one way in nature (i.e. giving or receiving instructions or assignments)?

25. Do you regularly communicate with people at your organizational level in other departments of the company?

26. Are there individuals in your organization who possess information which you need to perform your job effectively who do not or cannot share the information with you?

27. Describe the way decisions are typically made in this company.

28. How do you solve a problem you are having on the job?

29. What information do you need to make decisions in your job and where do you get it?

30. What kind of decisions on your job do you make completely on your own? Is this different than before the implementation of Goldmine?

31. What kind of decisions do you consult with your manager? Is this different than before the implementation of Goldmine?

32. What kind of decisions are made about your job without your involvement or input? Is this different than before the implementation of Goldmine?

33. Are there formal (written) or informal policies in your company which determine how you get the information you need to make decisions in your job?

34. Do you think you get all the information you need to make decisions on the job?
35. Would you consider bypassing your immediate supervisor if you needed an answer to an important question that he/she could not provide? How often, if ever, do you receive information from within the organization which is of low value or little use to you in your job? If and when you do, what kinds of information do you receive (be specific). From whom do you receive this information?

36. What happens if you make a poor decision?

37. What would you describe as the pros and cons of the implementation of computer technology in your job?

38. Do you have suggestions for improving the use of Goldmine and computer technology at your company?

39. Are there any other questions I should have asked to understand how changes in information technology affected decision-making in your job?
Appendix C: Job Diagnostic Survey

JOB DIAGNOSTIC SURVEY

On the following pages you will find questions about your job. Please read them carefully. The questions are designed to obtain your perceptions of your job and your reactions to it.

There are no “trick” questions. Your individual answers will be kept completely confidential. Please answer each item as honestly and frankly as possible.

Thank you for your cooperation.
Appendix C: Part I JDS Questions re: Job Autonomy

This question asks you to describe your job, as objectively as you can. Please do not use this part of the questionnaire to show how much you like or dislike your job. Questions about that will come later. Instead, try to make your descriptions as accurate and as objective as you possibly can.

Please circle the number which is the most accurate description of your job.

a) How much autonomy is there in your job? That is, to what extent does your job permit you to decide on your own how to go about doing the work?

1 2 3 4 5 6 7
Very little; the job gives me almost no personal “say” about how and when the work is done. Moderate autonomy; many things are standardized and not under my control, but I can make some decisions about the work. Very much; the job gives me almost complete responsibility for deciding how and when the work is done.

Listed below are a couple of statements which could be used to describe a job. You are to indicate whether each statement is an accurate or inaccurate statement about your job.

Write a number beside the question based on the following scale:

1 2 3 4 5 6 7
very inaccurate inaccurate inaccurate accurate accurate accurate
mostly uncertain slightly slightly mostly very
slightly inaccurate inaccurate inaccurate accurate accurate accurate

b) The job denies me any chance to use my personal initiative or judgment in carrying out the work. 

#_____

c) The job gives me considerable opportunity for independence and freedom in how I do the work.

#_____
Appendix C: Part II  Satisfaction Survey

Now please indicate how satisfied you are with each aspect of your job listed below. Once again, write the appropriate number beside the question based on the following scale:

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<th>1</th>
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<td></td>
<td>Extremely Dissatisfied</td>
<td>Slightly Dissatisfied</td>
<td>Neutral</td>
<td>Slightly Satisfied</td>
<td>Satisfied</td>
<td>Extremely Satisfied</td>
<td></td>
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</table>

d) The people I talk to and work with on my job.
   #_____

e) The feeling of worthwhile accomplishment I get from doing the job.
   #_____

f) The amount of independent thought and action I can exercise in my job.
   #_____

g) The amount of challenge in my job.
   #_____

h) The overall quality of the supervision I receive in my work.
   #_____
Appendix D: Management Interview Questions

BUSINESS DEVELOPMENT MANAGER QUESTIONNAIRE

DATE OF INTERVIEW:
NAME:
LOCATION/TERRITORY:
LENGTH OF TIME WITH COMPANY:
LENGTH OF TIME IN CUSTOMS BROKERAGE:
LENGTH OF TIME AS BUS. DEV. MANAGER:

1. Please describe the key functions and responsibilities of your job.

2. How has your work been affected by the introduction of computer technology?

3. As it stands now, is it possible to do your job without using the computer? That is, could you carry out your current duties and responsibilities if you no longer personally had a computer?

4. What were the company objectives established prior to the implementation of computer technology?

5. With the implementation of Darwin, and then Goldmine, what were the main expectations for changes in staff (BSDI and BSDE’s) job duties?

6. a) What are you looking for when hiring a BSDE or I?
b) How do you determine who teams up with who internally and externally?

7. Is there a clearly defined methodology in how the BSDI’s and BSDE’s are to do their job?

8. Do you believe that Goldmine has had an impact on the quantity of work that your staff complete?

9. Do you believe that Goldmine has had an impact on the quality of work that your staff complete?

10. How did you decide who would work in which territories when they were assigned?

11. Who determined the targets for the territories?

12 a) How do you primarily communicate and keep staff informed?
b) What kind of information do you forward via computer to your staff to assist them in their job?
13. What kind of information do you receive via computer technology? Is this different information than before technology?

14. Do you think you communicate more/less/same with your supervisors since the implementation of computer technology?

15. Do you think you communicate more/less/same with your subordinates since the implementation of computer technology?

16. Do you think you, as a manager, are consulted by staff more/less/same as before the implementation of computer technology?

17. Could you please tell me a little about the restructuring that happened with the implementation of computer technology; i.e. any jobs lost, number of people that resigned, number of jobs created, etc. in your region?

18. How would you describe the way decisions are typically made in this company?

19. How would you describe the organizational culture of this company?

20. Do you think that the introduction of computer technology has changed the level at which decisions are made in the organization? Do you think your staff make more decisions on their own that before Goldmine was introduced?

21. Where do you get the information you need to make management decisions? Is this different since the implementation of computer technology?

22. When Goldmine was implemented were there changes made to your management duties or responsibilities or how your job was organized? That is, were there changes made in the expectations of your management role?

23. What would you describe as the pros and cons of the implementation of computer technology?

24. Anything you would like to add, any additional questions you think I should have asked?