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THE TECHNOLOGICAL CHANGE PROCESS IN NONPROFIT HUMAN SERVICE ORGANIZATIONS: A FRAMEWORK FOR THE INTEGRATION OF PRODUCT-ORIENTED AND PROCESS-ORIENTED TECHNOLOGY

presented by

TIMOTHY ALAN AKERS

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of the requirements for

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George T. Rowan

Dr. GEORGE T. ROWAN, Ph.D.
Major professor

Date 16 NOV 1994

THE TECHNOLOGICAL CHANGE PROCESS IN NONPROFIT HUMAN SERVICE ORGANIZATIONS: A FRAMEWORK FOR THE INTEGRATION OF PRODUCT-ORIENTED AND PROCESS-ORIENTED TECHNOLOGY

By

Timothy Alan Akers

A DISSERTATION

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Resource Development and Urban Studies
College of Agriculture and Natural Resources
Department of Resource Development
and Urban Affairs Programs

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ABSTRACT

THE TECHNOLOGICAL CHANGE PROCESS IN NONPROFIT HUMAN SERVICE ORGANIZATIONS: A FRAMEWORK FOR THE INTEGRATION OF PRODUCT-ORIENTED AND PROCESS-ORIENTED TECHNOLOGY

By

Timothy Alan Akers

Currently the nonprofit sector is experiencing three major problems: 1) decreased funding, 2) little knowledge of the availability in, need for, and use of appropriate technology, and 3) to date, virtually no empirical research addressing the relationship between the product-oriented (i.e., hard) and process-oriented (i.e., soft) technological change process and its relationship to decision-making, and contextual and structural variables in the nonprofit sector.

Thus, the purpose of this study was fourfold: 1) to identify the product-oriented and process-oriented types of technology which are currently available, needed, or used by nonprofit organizations; 2) to examine how decision-making effects the technological change process with respect to product-oriented and process-oriented technology; 3) to understand how the technological change and decision-making processes are related to the nonprofit sector's contextual and structural organizational characteristics; and 4) to determine whether nonprofit human services organizations can be classified and characterized as either a product-oriented or process-oriented organization, or a combination of the two based on their various types of technologies.

The method used to collect data for this study was the administering of a primary data collection survey. The survey study was cross-sectional in nature and was

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administered to 590 nonprofits throughout Michigan that filed Internal Revenue Service (IRS) 990 forms in 1990, declaring themselves to be human service organizations.

The major findings indicate that, from the 22% (N = 110) that were valid returns, computer-based hardware such as desktop computers (85%), laser/ink jet printers (75.2%), and hard drives (88.6%) are currently available. Software, on the other hand, has high availability in organizations: spreadsheets (86.3%), word processing (90.2%), financial/accounting (84.5%), and database management (66.7%) software. Organizational development strategies, such as accounting and bookkeeping, financial management, and grant proposal writing are practiced by 94.9%, 83.7% and 72.4% of the organizations, respectively. Finally, the highest statistically significant correlations exist between product-oriented technology and product-oriented technological change and decision-making. Whereas, on the other hand, the highest statistically significant correlations exist between process-oriented (Organizational Development) technology/techniques and process-based technological change and decision-making.

I would like to dedicate this dissertation to

my parents

Patton and Willa Mae Akers

and to

my brothers and sisters

Bruce Edward
Terry Lee
Anita Darlene
Debra Sue
Donna Kay
Nancy Carol
Thomas Patton

and to my wife

Mary Anne Akers

and to the

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ACKNOWLEDGMENTS

The last and most difficult piece to write for the completion of this dissertation is the acknowledgment section. So many intelligent and generous people gave of themselves to assist me in my effort to complete this dissertation. First and foremost, I would like to thank my dissertation chair, Dr. George T. Rowan. Although, a simple thank you cannot capture the essence of my appreciation. Even words cannot convey how I feel toward this most intelligent and gentle man. But to convey my thanks in the third person will not capture how I feel. So I must express my heartfelt gratitude to this man in the first person, just as I must breathe to stay alive, so, too, must I clearly express my appreciation for everything he has done--and continue to do!

Dr. Rowan, I owe you a debt of gratitude and thanks which I will never be able to repay. The time and attention you had shared with me when I had almost given up is more than I can begin to describe. You showed me how to express to individuals and groups the significance of this research. You accompanied me to, and encouraged me in, meetings throughout Michigan, the United States and Canada while disseminating findings from this research. And you counseled me in my trials and tribulations during times of hardship when tragedy loomed deep in my family and my priorities became blurred, like a faded dream, lost in the grand abyss of time. For this, Dr. Rowan, I humbly thank you. And, based on all you have directed me in, I cannot truly credit this work as mine, but ours. The quality and significance of this research are a direct reflection nd testament to

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and testament to your knowledge, experience, and unyielding devotion to students and others alike. As I bathe in tears of gratitude for everything you have shared with me, Dr. Rowan, I thank you, sir!

I owe special thanks to Dr. John H. Schweitzer, a mentor, an advisor, and a friend. Dr. Schweitzer, you've taught me how to think; how to turn vague and illusive ideas into measurable constructs. You have been a master at measuring the immeasurable and testing the untestable--with this dissertation pushing the outer limits of organizational and technological change theory. For this Dr. Schweitzer, I thank you for your enduring patience, meticulous attention to detail, and professional guidance and assistance. You are a man of *immeasurable* quality!

I am also greatly indebted to Dr. Eckhart Dersch, a man to whom I owe special acknowledgment too because of his superior insight into organizational structure and change. Dr. Dersch, we traveled together to the opposite side of this planet, Taiwan. You continuously believed in me and showed it by holding me out an embassador, an envoy, on behalf of Michigan State University's College of Agriculture and Natural Resources, Department of Resource Development. Whether you realize it or not Dr. Dersch, it has been your belief in me that has given me the strength, the fortitude, to believe in myself and my abilities. For this, Dr. Dersch, I most humbly say, thank you, and may nature embrace your gentle soul with happiness and peace of mind and peace of spirit.

A special thank you is clearly reserved to Dr. Mark I. Wilson. Had it not been for his initial encouragement and financial support which enabled me to research the nonprofit sector, I may never have ventured into this unchartered area. I view you, Dr. Wilson, as a role model; someone I continue to call upon for advice and direction about the nonprofit sector. Dr. Wilson, thank you for directing me down a path to nonprofit sector research.

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Apart from all the support, encouragement, and time provided me by my dissertation advisors, I still owe a debt of thanks to some special friends, Tim Collardey, Tom Coleman, John Wise, and Victor Nichol. Thank you Victor for spending days assisting me in thoroughly checking my application of certain statistical techniques to the data. Furthermore, I am also grateful to David Egner, Executive Director of the Michigan Nonprofit Forum; Jeanne Vogt, President of the Accounting Aid Society; Ann Marston, President of the Michigan League for Human Services; and Dr. Rex LaMore, Director, Community and Economic Development Program. Each and every one of these individuals painstakingly critiqued the survey instrument that was administered for this study. Their knowledge of the nonprofit sector is unparalleled.

And, on a more personal side, I cannot even convey how thankful I am to my wife and friend, Dr. Mary Anne Akers. My beloved wife, words cannot begin to describe how deeply I love you for your support and encouragement. Had you not put the fire under me to finish, I would still be working on this dissertation. Mary Anne, your love and unflinching support was the flame that burned strong in my heart. Sweetheart, 1994 will be etched in my heart and memory for life; for this was the year that I received my Doctor of Philosophy degree and we were united in holy matrimony.

I wish to express my *deepest* thanks to the people who made all this possible: my family. As working class, central Appalachian people, we survived as a family when times were most difficult. Cultural and economic exploitation were commonplace. Where I grew up it was never expected for anyone to go to college, must less earn a Ph.D. Though times and circumstances were difficult, had it not been for my family, none of this would have been achievable. For teaching me patience, perseverance, and persistence, I hold myself out to my father, Patton Akers, and mother, Willa Mae Akers, as a proud son and product of the Appalachia people, my people.

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Even when times were tough, my parents, along with my brothers and sisters, Terry Lee and Thomas Patton, and Debra Sue, Donna Kay, and Nancy Carol, supported and encouraged me. They were always there when I needed a shoulder to cry on or a friend to laugh with. I can only hope that I will always make them proud of me.

More specifically, I need to express to my brother, Thomas Patton, how much I appreciate his encouragement and am proud to have him as my *little* brother. Tom, you have always been there when I needed you and have always been my most staunch proponent in whatever I set out to perform. You are not only my brother, but you are also my best friend. We have laughed and cried together. And, in case I have not said it enough, I want you to know how much I love and respect you my dear brother. Although they are not hear physically, I feel a need to communicate a sincere and warm thank you to my late brother and sister, Bruce Edward and Anita Darlene. Though you were not with me in body, you were clearly with me in spirit. I have always felt your presence of love. Thank you Brucy and Darlene. Love, your brother, Tim.

Last but not least, I sense a need to thank the United States Air Force. Had positive reinforcement not been a regular routine of the Air Force, I may never have overcome my lack of confidence in my capabilities. I salute the United States Military for always believing in people, regardless of culture, economic status, race, gender, or religion.

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CHAPTER I

INTRODUCTION AND OVERVIEW

Since the late 18th century when nonprofit organizations were in their infancy, their innovative character began to take many forms. The services provided by early nonprofits ranged from quasi-public institutions providing medical services to the establishment of colleges and external social control organizations oriented toward social services. These diverse social/human service organizations, for example, encompassed such activities as educating the youth, sanctioning deviant and aberrant behavior, and providing medical services to the aged, sick, and mentally and physically disabled (Hall, 1987). Each of these nonprofit organizations performed unique and needed services not otherwise provided by public and for-profit organizations. In essence, these social service nonprofits filled the gaps between the public's interest in maintaining a healthy and ordered society and private enterprise's interest in having available services that were not driven or serviced by traditional markets. In short, the existence of nonprofits has been and continues to be a testament to their social innovativeness generally and their organizational innovativeness specifically.

Contemporarily and philosophically, during the late 1960s as the nonprofit sector continued to evolve, its basic tenet of philanthropy had to readapt to social, political, economic and en

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economic and organizational change (Hansmann, 1987). That is, nonprofit organizations, especially nonprofits more intricately involved in micro-social services, have become adaptive innovators in their service delivery. "Indeed, one of the most spectacularly successful kinds of institutions in our 'capitalist' economy in recent years has been the nonprofit corporation, which has been a major source of both new knowledge and new technology" (Rosenberg, 1976). Thus, knowing the ways in which new knowledge and new technology are developed and utilized will provide better insight and become a better predictor as to how the nonprofit sector will change--organizationally and technologically.

The future organizational and technological changes of the nonprofit sector have sparked an interest in a broad segment of society. Take, for example, Johnson and Lucarelli's lead article in *Community Jobs: The National Employment Newspaper for the Non-Profit Sector*. Their article, entitled, "Computers and Information Technology in the Non-Profit Sector," echoes the concern by leading scholars and practitioners of the nonprofit sector, that "keeping up with the information revolution is becoming essential for success--and survival" (p. 1). These observations are consistent throughout the nonprofit literature and profession. Moreover, during the entire year of 1993, other mass publications such as the Chronicle of Philanthropy and the Nonprofit Times also echoed (and continue to resound) the charge that the nonprofit sector must advance both technologically and organizationally if it is to move into the 21st Century--and survive!

Case in point, there are currently more than 10 million users of the Internet's computer-based "Information Superhighways," with the Internet population growing at a rate of 15 percent per/month, and with each increase advancing almost exponentially

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(Rheingold, 1993). Given this trend, the nonprofit sector must begin to move both organizationally and technologically into the 21st Century if it is to keep up the pace of an ever changing Information Technology world; otherwise, should nonprofits fail to keep the pace in organizational and technological change, it will run the risk of becoming overwhelmed and ineffective with the continual increase on technological advances and on the demand for its services, as well as having to play catch-up to other, more sophisticated organizations--including those within its own community of service providers. Moreover, unless foundations and other donor sources also begin to recognize that supplying Information Technology is not simply the answer, but rather, that human resource investments must also be made in the areas of information-based training and overall organizational development, the nonprofit sector will continue to fall victim to simply receiving the Information Technology and not knowing how to use it to its maximum effect and efficiency for both their own organizations and communities.

The following sections in chapter one provide a brief overview of the technological change problems confronting the nonprofit sector and the overall purpose and significance of the study. Specifically, this chapter will draw upon three major issues in the nonprofit arena: 1) funding decreases, 2) the nonprofit sector's knowledge of technology, or lack thereof, and 3) the relationship between contextual issues such as technology, with respect to its product and process attributes, and the decision-making process nonprofit executives go through with respect to their organizational structure. Finally, the purpose and significance of the study will be briefly discussed.

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PROBLEM STATEMENT

This section provides a brief introduction and an extended overview of three salient issues in the nonprofit sector. The first section addresses the fiscal environment confronting the nonprofit human services sector. This section discusses funding trends which the nonprofit human services sector experiences while continuing to operate in an environment of scarce resources. Section two, on the other hand, endeavors to more clearly explain how understanding technology can become the impetus to help drive the technological change process of nonprofit organizations. And lastly, once the first and second sections are more clearly delineated and explained, the final issue will be to examine the relationship between the technological change process to organizational decision-making and its relationship to contextual and structural factors that may influence the product-oriented and process-oriented side of the technological change process. In short, the overall complexities of this study lies in trying to better understand change, be it organizational, technological, or the technological change and decision-making processes themselves. Whatever the case, it is this triad of relationships that need to be more thoroughly examined. Figure 1, for instance, provides a multidimensional picture of the depth and complexity of the various types of relationships needing to be examined.

Figure 1.

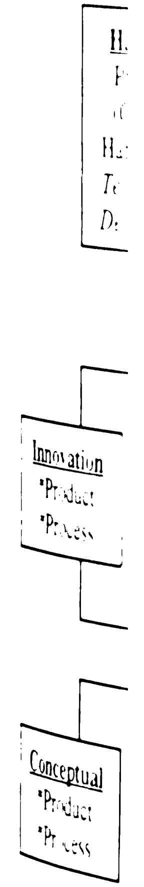
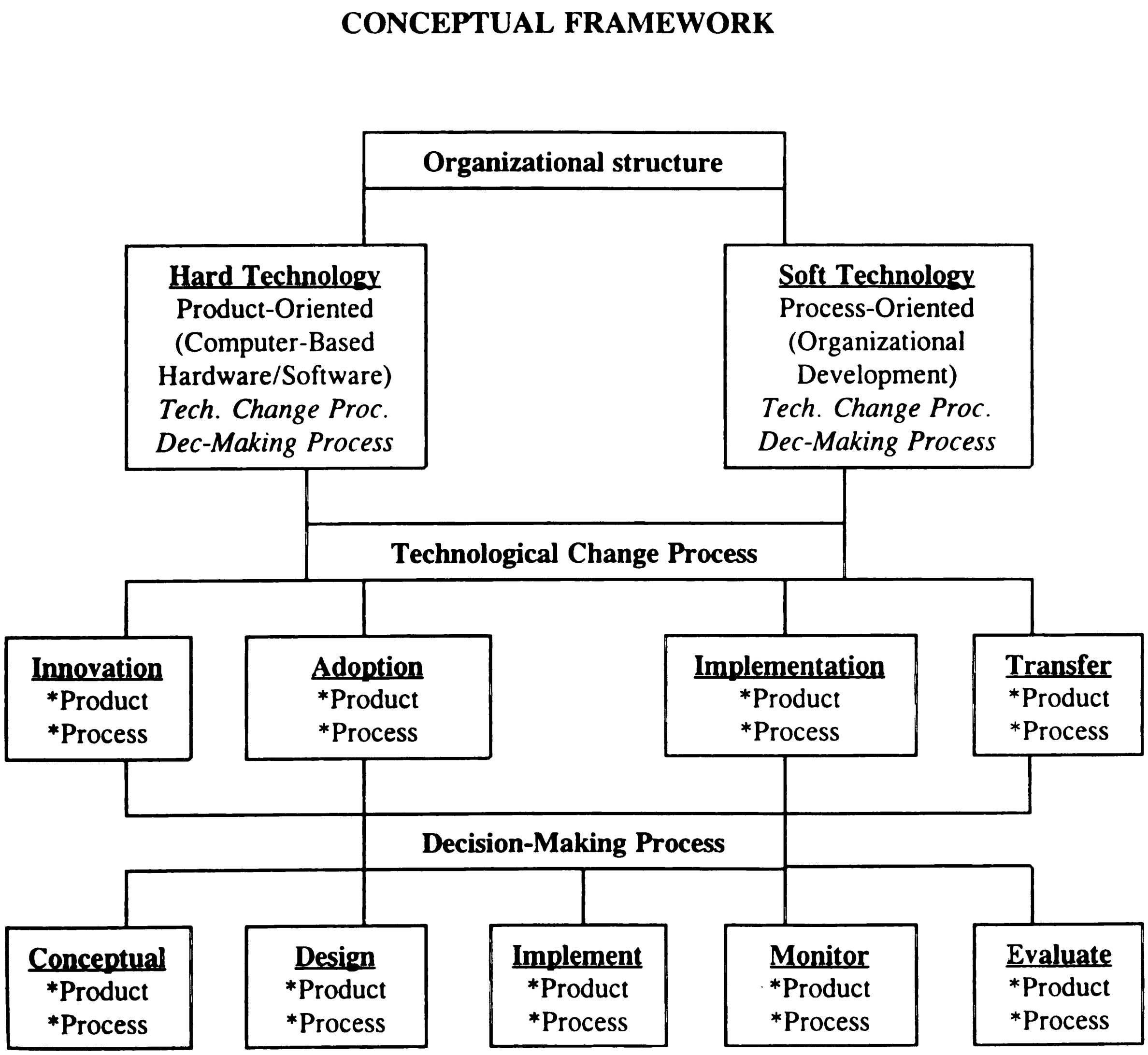


Figure 1. **Conceptual framework of the technological change and decision-making process**



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Introduction

Nationwide there exists more than 850,000 nonprofit organizations (Crimmins & Keil, 1983). Michigan, specifically, has more than 40,000 nonprofits, each diverse in organizational type and complexity (Wilson, 1991). Given the current economic recession felt by all sectors of society, nonprofits are even more hard-pressed to continue to survive and prosper. This may be attributable to the fact that nonprofits survive, generally speaking, by donative resources provided to them. In other words, to better understand why survivability is at issue, we should provide a perfunctory definition of the nonprofit organization itself. Simply put, nonprofit organizations are privately controlled, tax-exempt organizations to which donor contributions are tax deductible. Hence, when economic times are strong, donative and philanthropic giving become more generous. However, when a national, regional, or local economy is experiencing hard-times, contributors are fewer and more selective. In effect, philanthropists want to see the greatest return for their dollar.

Currently the nonprofit sector is experiencing three major problems: 1) decreased funding in an increasingly competitive environment, 2) little knowledge of the availability in, need for, and use of appropriate technology (in whatever way it is defined) that can be integrated into a nonprofit's social and technological organizational structure (Reshef, 1993), and 3) to date, virtually no empirical research addressing the relationship between the product-oriented (i.e., hard) and process-oriented (i.e., soft) technological change process and its relationship to contextual and structural variables in the nonprofit sector (Glisson, 1992; Misa, 1992). These three issues are pervasive throughout the nonprofit environment

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environment. The sections which follow are extended problem statements. They are intended to touch upon some of the more salient issues and problems confronting the nonprofit sector in general and the human services sector in specific.

Section One

The Urban Institute reports that since the 1980's, nonprofit social/human service organizations have suffered a 23.1% reduction in federal support. And, spanning the past 30 years, the private sectors' contributions to human service organizations have also steadily declined from 15% of total giving in 1962 to 9.3% in 1992 (Suhrke, 1993). Thus, the nonprofit human services sectors' economic dependency on external financial resources has compelled it, at times, to adapt too, or borrow from, existing technological resources, methods, and strategies from its donative sources, such as government, foundations, or for-profit corporations. Given the economic trends in donative giving, it is obvious that the nonprofit sector, specifically the human services sector, must advance into a more innovative and entrepreneurial state of operation. That is, as fiscal resources become more scarce, market changes will demand that nonprofits also advance to keep up with societal demands.

This process however will be no easy task. That is, it is generally recognized that the technologically innovative nonprofits that would otherwise adopt and implement appropriate technological innovations are, in effect, hindered because of 1) budget cuts, 2) few technologically sophisticated nonprofit organizational role models and developmental technological assistance providers, 3) limited research, and 4) an overall fear of chang

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fear of change in the nonprofit sector (Doctors, 1981; Drucker, 1990; Akers, 1992; Glisson, 1992; and Misa, 1992; Rowan & Akers, 1993). In addition, the problem is not only one of adoption or implementation of some technology, such as a computer system for mass mailings or a human resource strategy to help encourage employee participation in decision-making, but rather, one of defining 1) the nonprofit organizational structure itself, 2) the technology it utilizes, and 3) its technological change and decision-making processes it undertakes. Since the nonprofit human services sector does not exist within a vacuum--enjoying the luxuries of autonomy, self-sufficiency, and zero competition--it is finding itself competing in an environment with little experience in technological and organizational changes.

Therefore, the first major problem experienced by the nonprofit human services sector is how to define and differentiate technology. How technology is defined and differentiated within the human services sector will enable it to better understand how the technological change process occurs within its diversity of organizational structures. Joglekar (1989, p. 159) states that "HSOs [(human service organizations)] must actively identify technology that may help them become more effective and efficient, and carefully choose among the alternative technologies."

This identification of technology needs to start with the differentiation between product-oriented and process-oriented technology (Davenport, 1993); or, more generically, what may be correspondingly referred to as "hard" and "soft" technology, respectively. The tangible qualities (i.e., attributes) of *hard, product-oriented technology* are very obvious. These are the product components that one can taste, feel, touch, or smell They are the mac

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are the machines, tools, materials, and products--that is, hardware (Doctors, 1969; Rogers, 1982; Steinhauer, 1988). More specifically, such hardware technology can consist of computers, facsimiles, printers, software programs, hard drives, modems, central processing units (CPUs), telephones, video machines, and other Information-based Technological components.

In contrast, *soft, process-oriented technology* is more nebulous and difficult to identify. This is where a major problem lies in defining technology. Because people in general and organizations in specific are quite intimidated about hard technology, they become even more apprehensive when considering process-oriented technology and change. In effect, nonprofits need to increase their lexicon of terminology when thinking of technology. For example, process-oriented technology covers a vast mélange of terms, not the least of which are conceived of as ideas, knowledge, skills, procedures, principles, strategies, systems concepts, management control techniques, creative management changes, positive communication modifications and decision-making techniques, changes in job design and organizational structure, testing, innovation, adoption, implementation, and transference, as well as conceptualizing, designing, monitoring, and evaluating of products, processes, systems, and people, among others (Doctors, 1969; U.S. National Academy of Science and National Academy of Engineers, 1969; Rogers, 1982; Mansell, 1986; Steinhauer, 1988; Glisson, 1992; Akers, 1992; Rowan & Akers, 1993).

With this diversity of product-oriented and process-oriented technology, or, what we also refer to as hard and soft technology, the nonprofit sector will not only have to know how to appreciate the differences between the two technologies but must also learn how these tw

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how these two technologies interact to increase an organizations efficiency, effectiveness, service delivery generally, productivity, or to increase a nonprofit's overall performance. That is, the sector is going to have to become more acquainted with, and sophisticated in using and integrating, all types of technologies while at the same time advancing their entrepreneurial initiatives if the sector is going to continue to provide needed services (Drucker, 1985; Drucker, 1990). Although competition has been *perceived* as foreign to the nonprofit sector's philosophy, its philanthropy, its structure, and its very nature, there is some evidence of implicit competition in the voluntary sector (Boyle, Macleod, Slevin, Sobecka, & Burton, 1993), occurring primarily in nonprofit environs of competition in the grant application and selection process for limited fiscal resources.

In an environment of limited resources and fierce competition, nonprofits need to become more sophisticated in their understanding and application of technology and its integration in an organizational structure. This will entail delving deeper into this interdependency between product-oriented and process-oriented technology. However, even with all good intentions aside, this dependent relationship is unclear from both a contextual and structural framework.

Section two provides an extended overview of the problem of not fully knowing what types of technology, albeit hard or soft, are available, needed, and used by the nonprofit sector. The confusion as to how to define and differentiate between technology is pervasive in both the nonprofit and for-profit world. However, the need to better understand this duality between product-oriented and process-oriented technology and their relationship to one another is critical if technological change is to become a process undertaken

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undertaken to enhance the performance of nonprofits. In short, by trying to identify a common link between product-oriented and process-oriented technology, nonprofits will, ideally, be better able to "fit" the appropriate technology to the appropriate organizational system, structure, and/or process.

Section Two

As the demand for human services continues to increase, the nonprofit sector needs to become aware of, and knowledgeable in, diverse information-based and human resource technology that can be fused into its organizational structure (see Glisson, 1992, p. 185; Boyle, Macleod, Slevin, Sobecka, & Burton, 1993). The technological innovations currently being utilized and applied by nonprofit organizations are difficult to clearly identify however. For instance, internal organizational development for nonprofit human service organizations may simply consist of such processes as strategic planning, the development of a business plan, or the inclusion of financial management techniques into the organization. Whatever the case, such process-oriented technologies as those mentioned may be new to the organization and thereby be perceived as an innovation. Ideally these types of innovations need to be more thoroughly understood in terms of their relationship to product-oriented technology such as computers and fax machines, or electronic mail for that matter. In other words, with organizations and communities changing daily, their continued economic uncertainty and organizational instability compel them to become either more innovative, both organizationally and technologically, or step aside so as to allow other, more competitive and innovative nonprofits to develop.

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Tapscott & Caston (1993, p. 13) recommend that "[o]rganizations that cannot understand the new era and navigate a path through the transition are vulnerable and will be by-passed." Therefore, both the for-profit and nonprofit sectors must recognize that in order for either to develop a competitive advantage in the services they provide or the products they develop, they, too, must not only be willing to invest in new technological products and processes (Keyes, 1993, p. 41), but must also adopt a process perspective means to create a balance between product and process investments--with particular attention to process-oriented work activities and training (Davenport, 1993, p. 6).

With few exceptions, the investment or identification of new products or new processes is generally of little concern to nonprofits. That is, nonprofits are blinded by the immediate needs of their organization and their recipient population. They tend to not see the importance of developing appropriate types of technological resources for their organizations. Their belief that one blanket strategy serves all problems is pervasive throughout most of the sector. Yet this belief is quite misguided. Moreover, their lack of knowing or differentiating between the types of technology available--or in the types of organizational structures where such technology would be best used and integrated into--is limited at best and nonexistent at worst. In effect, nonprofit organizations, especially smaller human service organizations, are failing to recognize that they are competing in an environment where technology is already integrated into a multitude of organizational structures--e.g., government, homes, schools, businesses, foundations to a lesser extent, and other nonprofits. Drucker (1990), for example, stresses that nonprofit organizations need product differentiation just as much as it's needed in for-profit business (p. 79)

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For example, today it continues to be commonplace for nonprofit organizations to use *three-by-five* cards as a means of identifying the addresses of donors and members. Its does not stop there. Their need for understanding such processes as strategic planning, program planning, feasibility studies, or developing a business plan is, at times, perceived as being of little value. Our concern, however, is whether nonprofits even understand that a relationship between producted-oriented, Information Technology and process-oriented, organizational development strategies exist. However, the concern for addressing these relationships cannot even exist until the groundwork has been laid to define, differentiate, and identify the type of technology classified by nonprofits as being available, needed, or used by the sector itself.

Although with limited resources currently available in the community of nonprofits, the likelihood that the nonprofit would spend time, money, and other resources in finding appropriate technology to "fit" their organization's structure and culture is not likely. Rather, nonprofits are typically availing themselves of donative technology (e.g., computers and printers) from private sources such as foundations, banks and other businesses to simply be perceived as being technologically sophisticated, while, in actuality, this product-oriented technology simply remains unutilized or underutilized (Johnson & Lucarelli, 1994).

Consequently, the comments reverberating out of the nonprofit sector as to the types of technology most appropriate to develop a nonprofit organization's services, such as computers, are too difficult to learn, too time consuming, and are not practical for small nonprofits with simple needs. These sentiments may have some merit. That is, to simply place techn

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place technology into an organizational structure which may not be designed to accommodate such innovations may ultimately prove to be a mismanagement of fiscal and human resources, and possibly more damaging to the organization overall.

It is from this perspective that one must understand how nonprofit organizational executives perceive technology. The perception one holds of technology are likely to influence their behavior and their decisions (Reshef, 1993, p. 125). Section three is the most complex of the other two problems. It focuses on identifying whether relationships exist between product-oriented and process-oriented technologies, with respect to the decision-making process to either innovate, adopt, implement, and/or transfer the technology, and whether such technological change and decision processes are further influenced by the structure of the organization.

Section Three

This section builds on what has already been discussed thus far. The decision to advance an organization's technological state is a complex process of integrating two uniquely different systems. One, the product itself, such as that of Information-based Technology. The other is less tangible and more nebulous, namely, that of process. To understand these differences and their interdependent relationship to one another is to understand the very nature of the problem itself.

That is, the perceptions that product-oriented and process-oriented technologies are mutually exclusive and are independent and autonomous between and within one another is a perceptual problem plaguing the nonprofit sector's integration of such systems of technology

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technology and their influence on the overall organizational structure. This may be attributable to a lack of properly and consistently defining the technologies, followed by a neglect to analyze the process undertaken to bring about technological change through the merging of both the "hard" and "soft" technology, and finally, a confusion about the technological relationship to its organizational structure. Kramer (1987, p. 254) maintains that more research needs to focus on the influence that technology may have on the structure and function of voluntary agencies (Kramer, 1987, p. 254).

Furthermore, what complicates this facet of research on the technological change process and the nonprofit sector is that virtually no research exists that addresses the relationship between the technological change process and the nonprofit sector (see Glisson, 1992). In addition, there is a lack of an established relational linkage between technology and an organization's reaction to technological change (Reshef, 1993). There are also few studies conceptualizing the process of technological change from an empirical perspective (see Misa, 1992). And finally, there exists little quantitative information about the nonprofit sector in general (Rudney, 1987).

It is from past works and concerns from other researchers where one sees that venturing out on this journey is fraught with uncertainty and peril. The technological change process nonprofits go through is a direct reflection as to the extent technology is incorporated into their organizations. That is, the need to understand the technological change process and the decision-making phases guiding such change normally focuses on only two or three phases, such as introduction, design, and implementation (Glisson, 1992; Reshef, 1993). For purposes of this research, we have opted to examine four main dimensions

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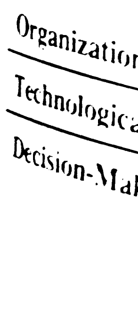
Figure 2:



dimensions: First, the type of technology, such as product-oriented or process-oriented. Second, the technological change process itself, encompassing such factors as innovation, adoption, implementation, and transference. Third, the organizational decision-making phases in the technological change process, comprising the phases of conceptualization, design, implementation, monitoring, and evaluation. And fourth, technology and decision-making in the technological change process as related to contextual and structural characteristics of the organization.

PURPOSE STATEMENT

The primary purpose of this study is to examine the relationship among organization structures, technological change processes and decision-making processes as they relate to product-oriented and process-oriented technology. Figure 2 provides a conceptual representation of the theoretical relationships.

Figure 2: Conceptual Relationships Between Type of Technology and the Nature of the Organization and its Technology Change and Decision-Making Process

	Product-Oriented Technology	Process-Oriented Technology
Organizational Structures	X 1	Y 1
Technological Change Process	X 2	Y 2
Decision-Making Process	X 3	Y 3

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Reshef (1993) states that a relationship of this nature has yet to be established. However, since our organizational units under analysis are in the nonprofit arena they will differ somewhat from Reshef's for-profit model. Theoretical research into the technological change process and the nonprofit sector is almost nonexistent. This gap in research needs to be filled. The most realistic way in accomplishing this task is to capitulate to the fact that no theory is without its flaws and no theory will answer all of our questions. By conceding this fact, we will have more latitude to describe relationships that may run counter to current theory. Thus, we exercise this freedom since this area of study is virtually unchartered, and new ground needs to be broken.

On the practical side of our study, nonprofit organizations are confronted with a formidable adversary--specifically, the reduction in fiscal resources by both the public and private sectors, as mentioned. In practical terms, nonprofits without financial resources may still be able to provide services to the needy, but certainly not to the extent which they may otherwise if fiscal resources are readily available and sustainable, be it through donative support or paid services. Whatever the case, nonprofits are clearly competing in an environment of scarce resources.

To merge this rather overstated dichotomy, it is postulated that one way to bridge the gap between theory and practice is by examining the technological change process of nonprofit human service organizations. More specifically, the purpose of this study is fourfold: 1) to identify the product-oriented and process-oriented types of technology which are currently available, needed, or used by nonprofit organizations; 2) to examine how decision-making affects the technological change process with respect to product-oriented

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oriented and process-oriented technology; 3) to more thoroughly understand how the technological change and decision-making processes are related to the nonprofit sectors contextual and structural organizational characteristics; and 4) to determine whether nonprofit human services organizations can be classified and characterized as either a product-oriented or process-oriented organization, or a combination of the two based on their various types of technologies.

The extent to which these four issues are examined will depend upon the model shown in Figure 1 *supra* which guides this research. It describes the relationship between organizational structure, technology, technological change, and technological decision-making. Specifically, in the model, technology is differentiated between product and process. The technological change process component consists of four salient variables: *innovation, adoption, implementation, and transference*. These change variables are dependent upon the decision-making process organizations experience when considering a technology issue.

For instance, the decision-making process consists of *conceptualizing* the type and role of technology in the organization. The *design* phase focuses on how such technology will function. *Implementation* will address the actual operation of the technology. *Monitoring* will center around the continuous assessment of the way technology is being utilized. And *evaluation* will determine its effectiveness to the organizations' overall goals and objectives.

In sum, this model is attempting to provide a more balanced perspective on how technology, both hard and soft, can be integrated into a nonprofit organization's overall technologi

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technological and social structure. The literature review section of this study will more effectively explain the complexities of technology, especially as it relates to the differentiation between product-oriented and process-oriented technology and their effect upon technological change in decision-making.

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CHAPTER II

LITERATURE REVIEW

BRIEF COMPARISON BETWEEN DOMESTIC AND INTERNATIONAL TECHNOLOGICAL TRANSFERENCE

Most of the nonprofit literature distinguishes between organizational type, purpose, and tasks. The purpose of this review section is to provide an overview of how technology has influenced the very nature of the nonprofit sector, both domestically and internationally. Extending out from developed countries to less developed nations, technology transfer has circumnavigated the entire planet. The concern for technological change and the transference of technology is at both the international and domestic levels.

At the national level, community residents--operating as agents of change for church groups, foundations, and other nonprofits--have shared in transferring knowledge and expertise to communities generally and disadvantaged groups specifically. These knowledge sharing activities ranged from Goodwill Industries' thrift shops training the disabled to the Girl and Boy Scouts teaching youth to handle money and work with their neighbors (see Crimmins & Keil, 1983). Each of these activities was indigenous to the community and was based on the transferring and sharing of knowledge.

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Even earlier throughout United States history, Native Americans taught European settlers how to live and prosper in the wilderness of America (Sufrin, 1966). Such transferring of technology was already inherent and indigenous to this native land, yet, when development began to expand its artifacts of technology followed. As the society grew more complex it began to transfer its technologies to other structures and other societies.

Consequently, what was left in its wake was an internal source of indigenous knowledge--Native Americans--creative and full of life, left behind to be a resource viewed as less technologically sophisticated and of little developmental value. Thus, as developed countries prospered and became more advanced socially, educationally, economically, and technologically, less developed countries became the recipients of this advancement. The result has been a seeding of technology to try and speed up development of other nations.

Internationally, the United States has surpassed all nations throughout the world in providing technology and technical assistance to less developed nations. However, the cost of this benevolence on the social fabric of developing nations is not so easily measurable and identifiable. For example, Axinn (1988) discusses how the placement of product-based (i.e., hard) technology into less developed nations has proven to dramatically stifle the human development process of those recipient communities. The donation of tractors to cultivate land, pumps to extract water from wells, the building of roads, the increased production of agriculture, and other such technologically "developmental" advances have all had an effect on the social structure of these societies - both positively and negatively.

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Specifically, once the technology was put into place, it would operate appropriately until it had either no more fuels, oils, or whatever, or until it experienced a malfunction. The process-oriented initiatives in training were not normally a part of the development package. In effect, because they were not indigenous to the recipient communities, once the product-oriented technology ceased to operate, they would tend to lay dormant indefinitely, or until an external, technology transfer agent could arrive to correct the problem. Moreover, the Nongovernmental Organizations (NGOs) providing the technology also fell victim to their own ignorance of such technology.

From a domestic perspective, nonprofit organizations throughout the United States have also been recipients of such technological advances, although more information-based in nature. The experience gained from the years of providing technologies and technological assistance to less developed nations has shown that physical resources are not the only answers to development, nor is external technological assistance; but rather, that both the product and the process must occur and be bound together, and must occur within the structure in which they are being integrated (Davenport, 1993). Finally, when providing technological assistance it has been, and still is, generally assumed that assistance must be an inherently external resource used for internal organizational and community development (Sufrin, 1966; Domergue, 1968; Uphoff, 1986). This assumption appears to be consistent throughout the literature. Although, this assumption is strongly questioned by most scholars of technology transfer.

In short, this section provides a unique comparison between domestic and international development, and product-oriented and process-oriented technology. That is. since th

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is, since the late 1940's, international developers and development have come to recognize and appreciate the fact that by simply placing product-oriented technology in organizations and communities is not necessarily the answer. Rather, process-oriented technology is just as significant, if not more so. For instance, when local community-based nonprofit organizations are experiencing technological, product-oriented change, they, too, run the risk of simply allowing such technologies as computers, facsimiles, modems, spreadsheets, etc. to become an unutilized or underutilized resource. The ideal situation espoused throughout the literature is to integrate more of a training, process-oriented approach to technological change.

NONPROFIT HUMAN SERVICE ORGANIZATIONS

Nationally, the nonprofit sector contributes to 6% of the national economy and 9% of the total national employment through the manufacturing of goods and services (Van Til, 1988). More specifically, in terms of actual dollar amounts and employment numbers, smaller nonprofits more active in social and human services, community development, and the arts, account for more than $21 billion of the expenditures and employing well over 10 million people (Fink, 1989, p. 118). Although the nonprofits have been primarily service oriented (Crimmins & Keil, 1983), with its historical and theoretical origins rooted in benevolent, community service work, it has continued to be a strong economic force while at the same time being a safety net for individuals and communities lost in an economic abyss between government and for-profit downsizing and relocation.

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The nonprofit human service organizations specifically have had to adapt and readapt to an ever changing environment, just like their governmental and for-profit counterparts. The services they provide encompass a plethora of activities, such as children and youth services, family and residential care service, and a broad range of multipurpose services such as those of the Urban League, Salvation Army, and the American Red Cross, just to name a few.

Classifying human service organizations into various typologies is a common practice among nonprofit researchers. Human service organizations have consistently been collapsed into less complex categories. Hasenfeld & English (1974), for example, distinguished between people-changing and people-processing human service organizations. People-changing organizations consists of such diverse entities as hospitals, prisons, churches, and universities. People-processing organizations, on the other hand, includes diagnostic clinics and employment centers, for instance.

Less specific and more encompassing in the classification of human service organizations is the distinction made by Tucker, Baum, & Singh (1992, p. 51). They maintain that although human service organizations are from the same population they may significantly differ in important ways. Specifically, Tucker and his colleagues differentiate between specialists and generalists organizations. For example, a specialist organization can be characterized as being oriented to specific environmental features, such as that of a voluntary social service organization that has a single domain (e.g., providing health services for youth, or interpretation services for new immigrants). The generalist's organizations, on the other hand, are more adaptable to a broad range of environmental conditio

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conditions, such as a day-care center that provides a number of services to children across a range of different age groups (Tucker, Baum, & Singh, 1992, p. 51). These generalists' organizations are more multipurpose in scope. Thus, both of these organizational classifications attempt to identify certain criteria in developing such a dichotomy.

Apart from what has been said thus far, human service organizations continue to be classified in other ways. These classification schemes do not only differentiate organizations by purpose, size, structure, tasks, and clients, but also by implying that human service organizations differ in terms of their ambiguous and indeterminate technology (Tucker, Baum, & Singh, 1992; Kramer, 1987). This leads us to the next section which explains why technology means many different things to many different people.

HARD AND SOFT TECHNOLOGY RELATIONSHIP TO THE TECHNOLOGICAL CHANGE PROCESS AND ORGANIZATIONAL PHASES

Technology Defined

Technology, in its conventional sense, is typically perceived in the context of human artifacts, such as products, tools, machines, and materials (Doctors, 1969; Steinhauer, 1988). More specifically, traditional types of technology that are normally referred to as hardware, consist of, but are not limited to, ambulances, computerized caseloads, fax machines, bulletin boards, electronic mail systems, various computer technology, video machines, telecommunication systems, information processing hardware and software, data retrieval systems, modems, and other technologically innovative and adapt

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The defining of technology itself is inconsistent throughout the literature and community of scholars. Galbraith (1972), for example, defines technology as "the systematic application of scientific or other organized knowledge to practical tasks" (p. 31). In expanding the meaning, Pacey (1984) defines technology (or the practice thereof) as "the application of scientific and other knowledge to practical tasks by ordered systems that involve people and organizations, living things and machines" (p. 6). Both definitions capture the quintessential elements of technology: product and process.

Therefore, if perceived more broadly, the lexicon for defining technology will embody what Rogers (1982) considers as "software aspect[s], consisting of knowledge, skills, procedures, and/or principles...[that] are an information base for the tool. Almost every technology embodies software aspects, although they are often less easily visible than the hardware aspects" (p. 138). Moreover, Rogers espouses that

> "[a] technology usually has hardware and software components. Our definition implies some need or problem. The tool has (1) a material *[hardware]* aspect (the equipment, products, etc.), and (2) a *software* aspect, consisting of knowledge, skills, procedures, and/or principles that are an information base for the tool. *Almost every technology embodies software aspects, although they are often less easily visible than the hardware aspects*" (Rogers, 1982, p. 138). (Emphasis added)

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Thus, technology is more than just "gadgets." Rather, technology is a combination of both hard and soft attributes, or, more specifically, products and processes. Rogers expanded his explanation of technology by stating that software technology is more nebulous and difficult to clearly identify as a technology. For example,

> "sometimes the hardware side of a technology is dominant. But in other cases, a technology may be almost entirely comprised of information; examples are...a news event...and management by objective (MBO) *[principles]*. ... *But even though the software component of a technology is often not so apparent to observation, we should not forget that technology almost always represents a mixture of hardware and software aspects*" (Rogers, 1982, pp. 12-13). (Emphasis added)

This technological dichotomy between hard and soft, or product and process, is not a new and novel distinction. Quite to the contrary, for almost thirty years, since 1969, the U.S. National Academy of Sciences and the National Academy of Engineers indicated that

> "we tend to view technology primarily in terms of machines and physical instrumentation, that is, hardware. However, today technology consists increasingly of 'software,' that is, the organization and systematization of ways of doing things, and not merely the ways of making things or the

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The concern espoused by the National Academy of Science and Engineers almost thirty years ago has guided others in their quest to find technology that can more readily be integrated into various organizational structures. With conventional views of technology being brought to light, new and more innovative ways of identifying technology are already upon us--namely, that of Information Technology.

The Information Technology era has not lessened the complexity of understanding technology. Tapscott & Caston (1993) maintain that the Information Technology era is shifting the traditional paradigm of products and processes. They state that we are entering an era whereby technology, organizations, and leadership are all experiencing a drastic technological change in which organizations must navigate a path through this transition or become vulnerable to the more technologically and organizationally sophisticated (p. 13). In other words, in order to compete in such a turbulent and fast paced environment, Eveland (1981) recommends carefully assessing the interactions between the technology itself, be it product- or product-oriented and the settings into which it will be implemented (p. 121-122).

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Technological Change

The term 'technological change' is a multidimensional concept that is difficult to define and operationalize. Reshef (1993) maintains that an acceptable definition or understanding should emphasize different aspects of the technological change process, such as "the stages comprising the process--the introduction, design, and implementation of new technology; the degree to which the change is (in reality) or is perceived to be peripheral or central to the tasks workers perform and routine or radical; whether it is a process or product change" (pp. 111-113).

The distinction between product-oriented and process-oriented technology, for example, becomes the central focus when considering technological change, such as that of Information Technology. The issue of technological change takes many forms. The increase in the adoption and implementation of Information Technology is the most common form of technological change occurring throughout nonprofit organizations. One must recognize that computerization specifically or Information Technology generally requires some change in social relationships (Kling, 1991). One cannot simply place technology into an organization and not expect change to occur.

The technological change normally consists of some or all of the process of innovation, adoption, implementation, and transference (Lambright, 1979; Tornatzky & Klein, 1982; Rowan & Akers, 1993). Each of these technological changes is endemic to the operational nature of product and process changes. That is, a process-oriented change can consist of strategic management of human resources, management training, leadership development, creative management changes, positive communication modifications and decision-making techniques, changes in job design and organizational structure and/or communica

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communication (Odiorne, 1984; Daft, 1986; Mansell, 1986; Akers, 1992; Rowan & Akers, 1993). In other words, process-oriented technological changes look at the gestalt, or, psychosocial structure, of the organization, along with its overall processes and interactions for carrying out tasks, and analyzes its relationship to the product-oriented, technical side of the technological change--i.e., hardware. In short, Mansell maintains that these soft, process-oriented technological changes have an impact equal to or greater than that of hard, product-oriented changes. The components to be identified take into account elements of both product-oriented and process-oriented technology.

Innovation

Therefore, in order to develop a more thorough understanding of the technological change process, each of the individual stages must be developed separately. Innovation is similar to its technology counterpart. It, too, is difficult to define and conceptualize, especially since an innovation can possess both physical and processual properties (Steinhauer, 1988). Innovation is a ubiquitous concept and often receives countless criticisms of the notion that it is a linear process (Callon, 1987, p. 83). It can encompass items of the most diverse kind. Specifically, innovation can consist of product and process changes, economics changes, social restructuring, organizational transformation, or, as alluded to earlier, technological changes (Diederen, Kemp, Muysken & de Wit, 1990).

By their very nature, nonprofit organizations are quite innovative--especially with respect to social innovations, such as micro-loan programs, housing development, community policing, and others. Drucker (1993) points out that social innovations are equally im

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equally important and often more important than scientific innovation (p. 5). However, for most organizational types, including nonprofits, soft, process-oriented innovations are quite difficult to sell to management because of the nature of the innovation--namely, that of ideas, concepts, and abstractions (Steinhauer, 1988).

Kanter & Summers (1987) support the notion that innovation, regardless of its process-oriented nature, can be assessed in terms of its level and type for both for-profit and nonprofit. In so doing, measures can be developed to analyze the structural factors that are either inhibiting or encouraging the process of innovation (pp. 161-162). For instance, Barembaum & Coleman (1989) argue that for an innovation to succeed, it requires a strong commitment by management, a clear communication of objectives of the change, and must be supported by staff during the change process (p. 181). Since innovation is, by its very nature, a ubiquitous concept, it is perceived as being everywhere, thus leading one to recognize that the real problem when bringing about an innovation is trying to learn from it (Brown, 1993, p. 83).

In sum, the effectiveness of an organization is directly related to an organization's innovative potential to meet future demands (Kanter & Summers, 1987). That is, being able to generate new products and services through the use of other innovative products and processes. This merging between both physical and processual characteristics of a technology is only as effective as the organizations which are willing to adopt such technological innovations.

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The "fit" between product-oriented and process-oriented innovation is directly related to the "fit" between product-oriented and process-oriented adoption. In other words, unless this balanced, symmetrical relationship is better understood by organizations, a product-oriented technology may be adopted but possibly not its corresponding processual properties or vice versa. Steinhauer (1988) maintains that the adoption of an innovation depends on whether such innovation is perceived as difficult to understand and use. In effect, the more complex the innovation, the less likely it will be adopted and implemented (p. 455).

In addition, the complexity of the innovation is compounded not only by both its physical and nonphysical properties, but rather, by the interaction and interrelationship of such properties (i.e., "fit"). To understand these interdependent technologies is to appreciate the relationship between the individual and the machine. In other words, the complexity of the adoption process is usually complicated by behavioral, psychological, or organizational factors (Floyd, 1988, p. 126).

Regardless of the type of technology being adopted, the nonprofit organization, for example, is structured in such a way that the technological changes must be supported and sanctioned by the institutional environment (Hasenfeld, 1992). Stated more succinctly, "[i]t is in this sense that human service technologies reflect *practice ideologies*, namely they reify certain belief systems about what is 'good' for the client, and their efficacy is measured in light of these beliefs. These beliefs provide human service workers with the rationale and justification for their practice" (p. 13). Therefore, once the executive director or an

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director or another major decision-making body has approved an innovation, to where the organization has begun the process of setting agenda for such technological innovation, adoption has occurred (Lambright, 1979).

Once the decision has been made to adopt a new technologically innovative product and/or process, Preece (1991) recommends that a series of decision-making steps be undertaken, consisting of such tasks as the idea to adopt a new technology, the conducting of feasibility studies, performing capital investment analysis, operationalizing the new technology, and evaluating the technology at various stages. These decision-making steps are intended to more clearly spell-out the details needed to implement the innovative products and/or processes.

Implementation

The implementation stage in the technological change process occurs when the organization's staff actually uses the new idea, product, technique, or behavior (Daft, 1986). More specifically, the implementation process consists of the day-to-day operation of the technological product and/or process. The implementation process is concerned with translating and transforming action plans into organizational actions (Huse & Cummings, 1985). This requires a reshaping of organizational structures and working arrangements (Eveland, 1981). Diederen, Kemp, Muysken & de Wit (1990) contend that any investment in technology, specifically , requires changes in social relations and organizational modifications.

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Take, for example, the implementation of a new product. The implementation of a product will require some measure of change in the organizational structure and function. That is, the product may consist of simply developing new workplans and job descriptions for staff who operate or work around the new technology. On the other hand, if the implemented technology is more process-oriented, such as conducting marketing research, developing fundraising strategies, performing a project feasibility study, initiating financial management practices, or whatever, some product will also need to be adopted and implemented, even if it appears to be as simple as designing a new form or checklist.

Lambright (1979) cautions that "[m]any hardware and managerial innovations that could be helpful in mitigating urban problems are lying fallow. Either they are not adopted by their intended users, or, if adopted, they are not implemented and placed into routine service. They are often abandoned or so diluted that they cease to be innovative in any sense" (p. 2). In short, if the technological innovation has been implemented, the next step would be to determine at what point should the transference of the technology occur, either within or outside of the organization.

Transference

Technology transfer is traditionally thought of in a geographical sense, where the transfer of technology is geographically separate, that is, from those who provide the technology to those who receive the technology. The transferring of technology can mean the transfer of products or skills from one area to another. For example, from a more traditiona

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traditional and geographical perspective, the transfer of a technology can originate in an organization (nonprofit, for example) and be transferred to a community or another organization, for such things as leadership training for community resident empowerment, assisting a community in need of home ownership counseling, helping identify community reinvestment initiatives for a neighborhood, or some other form of community development. In effect, technology transfer, by convention, is most obvious when an organization or community receive a product or process not otherwise existing within such organizational or community setting.

With respect to *intra*organizational technology transference, it, too, can consist of either a product or process being transferred. The transferring of a computer and its attending hardware from one department or workstation to another is, by convention, a transferring of technology. That is, the transferring of a new method or strategy from one department to another is technology transfer. The simple communication of a new innovation usually goes by the name of technology transfer (Brown, 1993). Whatever the case, some restructuring, either environmental or organizational, will need to take place. Therefore, unless implementation has already occurred, it will not be possible for an effective technology transfer program, project, strategy, or process to ignore implementation issues (Eveland, 1991).

Nonprofit organizations in general and their staff in specific are, by their very nature, change agents, or, more specifically, technology transfer agents. They are consistently innovating, adopting (and adapting), implementing, and transferring organizational and community development strategies. In effect, nonprofit organizations already hav

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already have staff trained in various types of product-oriented and process-oriented technology. And, unless this indigenous knowledge is kept within its existing organizational domain, nonprofits will run the risk of losing vital expertise whereby it may result in needing to retain the services of exogenous (i.e., outside) technology transfer agents. Keyes (1993) states that

> "organizations who do invest in the educations of their technology staff often see this investment jump ship and move over to the competition. As a result, organizations are finding themselves saddled with technology staff with obsolete skills and no way to quickly move into the newer technologies that show some competitive promise" (p. 41).

If Keyes' observations are correct, it is at this point where training of staff and volunteers is most needed in the nonprofit human services sector. This brings us to our next section which focuses on the organizational decision-making phases. It is in this section where staff and volunteer knowledge and participation becomes paramount to effective organizational and technological change and development.

ORGANIZATIONAL DECISION-MAKING PHASES

The technological change process previously discussed takes a ubiquitous look at the stages an organization will experience when product-oriented or process-oriented technological changes occur. Those stages focus on the salient changes in the overall organizatio

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organization. However, the organizational decision-making phases of the technological change process are more concerned with staff participation and perception in making technological change decisions.

The organizational decision-making phases are identified as conceptualize, design, implement, monitoring, and evaluate. Each of these phases help determine the level staff may participate in technological change. Reshef (1993) states that employee participation may occur at all or any of the decision-making stages. In addition, the decision-making phases assist in enabling a more complete understanding of the perception staff may hold toward technological change.

By analogy, we can think of the adoption and implementation of a micro-computer into a workstation. The computer is thought of as a tool (i.e., *conceptualized*) to help staff work more effectively and efficiently, and to increase and enhance productivity. Eventually, a blueprint (i.e., *design*) or proposal has to be drafted to show how the system will interact with other human and technological systems in the organization. Next comes the decision to place the computer on a desk and "turn it on" (i.e., *implement*). While the computer has been in operation for a week, for example, staff would watch (i.e., *monitor*) the system being used, its effectiveness and efficiency, and its overall contribution to aiding staff in becoming more productive. Finally, staff would make a judgment (i.e., *evaluate*) to determine the computer's usefulness to the organization, and decide whether it met their original goal of becoming more effective and efficient, for example. This analogy characterizes the most basic decision-making process a nonprofit organization may experience when considering the adopting, implementing or transferring some type o

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some type of Information Technology or organizational development innovative component or strategy, respectively.

Conceptualization

The conceptualization decision-making phase begins the process of deciding whether an innovation will be adopted, implemented, or transferred to other workstations, departments, organizations, or communities. Specifically, the conceptualization component is concerned with determining the nature of the technology and its relationship to the organization or community. In other words, it is conceptualizing the feasibility of the "fit" between product and process or system in which it is to be introduced. It asks, "What if . . . "

In Tapscott & Caston's (1993) recent publication "*Paradigm Shift: The New Promise of Information Technology*," they maintain that as each generation's reality changes, fundamental shifts occur in their organizational and competitive environment, thereby requiring shifts in conceptualization of technology, specifically, Information Technology. For example, Information Technology is being implemented in many organizations with little formal analysis, planning, or design (Floyd, 1988). That is, there appears to be a lack of clear understanding of what issues need to be addressed, such as what is the appropriate type of technology or training for an organization.

Take, for example, a workstation that only intends on using a computer with a hard-drive for such tasks as backing-up files, electronic mail, word processing or mass mailings. The decision to place a top of the line micro-computer (such as 486SX) with state-of-the-a

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state-of-the-art software and hardware may simply be inappropriate in such an organizational/workplace environment. In effect, it may be an ineffective means of utilizing resources which may otherwise be directed in a more appropriate manner. This is the type of issue which needs to be addressed by the technological change committee who is trying to conceptualize present and future needs of those employees or volunteers who will use the technology. That is, this may require designing an innovation or organizational structure that can "fit" the needs of the organization or community receiving the technological change innovation.

However, problems tend to arise when an agreement cannot be made as to what type of technological innovation should be incorporated into the organization. Steinhauer (1988, p. 446), for example, states that "there has not been 'conceptual' agreement on the term 'innovation.'" Given this fact, it becomes obvious that conceptualizing an innovation for a nonprofit will not be any easier for decision-makers, especially if they are all separate from the lower levels of the organization's rank-and-file.

As stated, the conceptualization phase is the initial phase of the decision-making process in deciding whether to adopt, implement, and/or transfer an innovation. The conceptual phase begins the process of deciding *who* will participate in a technological change. This phase of decision-making is critical because the more participation that occurs in the earlier phases in deciding whether to adopt, implement, or transfer a new technological product or process will have a strong effect on the understanding of *why* the technology is being introduced (Preece, 1991).

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The design phase in the organizational decision-making process examines the organizational structure and function and determines the appropriate "fit" in which the technological change can come about. That is, the design phase is a "road map" to help guide the change along. The design phase places the technological change process in a dependent position while still keeping the overall organizational structure in an independent position. Glisson (1992), however, placed technology and structure in dependent roles by differentiating between design and implementation. In Glisson's design phase, management designs an organization's structure to complement management's technology design.

The decision to classify technology or organizational structure as either a dependent or independent variable is an arbitrary decision. Even organizational designs are expressions of theories in which leaders hold about human behavior (Pasmore, 1988). Moreover, the design phase is an expression of ideas, systems, blueprints, interrelationships between products and processes, resource availability, and the type and location of training. The design phase should take into account each component in the technological change process (Reshef, 1993). However, this matrix of complex distinctions between systems, products and processes, people, technological changes, and organizational decision-making phases can, at times, become blurred when considering how each design needs to relate to other designs.

The decision to design an innovation doesn't necessarily mean it will be adopted by the organization, nor does it mean it will be implemented or transferred. It must be recogniz

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recognized that each of the technology change components (i.e., innovate, adopt, implement, and transfer) is separate yet related to the decision-making design phase, as well as the other phases. Barenbaum & Coleman (1989) recommend that staff need to be clearly told the purposes of the technological and system changes in order to reduce potential resistance by staff who are ill informed. In addition, Pasmore (1988) states that broad participation from staff will continue to be a primary feature of the sociotechnical system design. Pasmore further goes on to say that "employees must understand both the equipment they use in the conversion process and the process, itself" (p. 103).

In sum, to achieve effective and comprehensive process designs, this phase in the decision-making process is best accomplished through a series of workshops and brainstorming sessions (Davenport, 1993, p. 154). The specific steps of the design phase itself are a difficult process to identify since every system is unique and every technology is different.

Implementation

The distinction between design and implementation is a matter of degree. Where the design is a "blueprint", the implementation is a means of actually using the new idea, product, process, technique, or behavior in the organizational structure or community. In other words, implementation is "a complex set of interactive behavior, involving gradual shaping of both the technology and the ways in which it is used. Incorporating new technology into an existing organization requires modifying organizational structures and working arrangement" (Eveland, 1981, p. 125).

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As we begin to discuss the implementation phase of the decision-making process, we should keep in mind that employees tend to be more motivated to participate in this stage as opposed to either the conceptualization or design phase (Reshef, 1993). This may be explained, in part, by the fact that implementation is more hands-on. To implement an innovation, for example, is to "try it out," or "turn it on." Thus, the decision to implement a product or process is more tangible and less abstract.

The implementation phase of the decision-making process translates the design into action. This decision requires a high degree of understanding and commitment from top management, which can be achieved by including key people in the early conceptualization and design phases, or what Huse & Cummings (1985) refer to as action planning stages. As Kanter (1983, p. 243) points out, "a great deal of innovation seems to demand participation, especially...at the implementation stage." However, the level and type of participation depends on whose participating and at what point in the technological change and decision-making process. Moreover, York (1982) stresses that participation and involvement from all rank-and-file must be included, especially those who deliver the program services. Their involvement in all phases of the decision-making process will strongly motivate them to be committed to the decision to initiate technological change.

Monitoring

The monitoring of technological change is to determine, from observation or some other means, whether a change is occurring. Monitoring can span the entire technological change process. The decision to monitor a change in the technological restructuring process is t

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process is to identify and observe the steps taken by decision-makers. Moreover, it is the observation of not only people and technology, but rather, systems that are interacting with the proposed or adopted technology.

The monitoring phase of the decision-making process is a way to assist decision-makers who are deciding whether to innovate or whether to continue with an existing technological change. Beer, Eisenstat, & Spector (1993) state that "[t]he organization has to know how to continuously monitor its behavior--in effect, to learn how to learn" (p. 227). And, to echo the sentiments of other researchers, Beer et al recognizes the need for the monitoring process to be based on broad participation from all in the organization, as well as the recipients external to the organizational structure--i.e., the community (p. 228)

Evaluate

The final phase of the decision-making process is that of evaluation. The evaluation phase is a means to help determine whether stated goals and objectives of the proposed or actual technological change are being achieved (Huse & Cummings, 1985). This phase also encompasses all components of the technological change process. Preece's recommendation for evaluation is somewhat limited. Specifically, Preece indicates that an evaluation needs to occur at the post-operationalization phase of the adoption process. Although his view is correct, its scope of evaluation is quite narrow. Ideally, the evaluation phase should include decisions to assess the entire technological change process, starting with innovation and ending with transference. In other words, the evaluation can be either formative or summative. Formative evaluations provide continuous feedback throug

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throughout the life type of the project or technology. Whereas a summative evaluation will occur toward the end of a project that has an ending date, or a technology that is to be evaluated for a given time period.

In addition, the decision to evaluate a potential or actual technological change can encompass an assortment of evaluation techniques, such as, interviews, questionnaires, observations, or some other means that will assist in determining whether stated goals are, or would be, achieved. Again, this phase should also include a diverse group of members of the organization or community who are familiar with the proposed or actual technological change. The more difficult aspect of the evaluation begins when an organization is first considering whether or not to adopt an innovation. Even the preliminary decision to consider an innovation for adoption and subsequent implementation or transference carries with it the need for a cursory evaluation. These may consist of determining whether existing technologies, or techniques, are inappropriate or outdated for the current state of affairs--organizationally, communally, economically, or socially. Therefore, this final phase of the decision-making process is quite significant. Especially, when considering whether current technologies are serving their purpose and are effective and efficient in the delivery of services.

TECHNOLOGICAL AND ORGANIZATIONAL STRUCTURAL RELATIONSHIPS

The relationship between organizational structure and technology classification has been proposed by researchers interested in exploring this unique dichotomy Woodward's research, beginning in the late 1950's and moving on into the early 1980's, postulated that an org

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an organization's structure must complement its technology. This relationship is more commonly referred to as the "technological imperative."

Woodward (1965), for example, found a relationship between the span of control of first-line supervisors and the type of technology used in the production system. Some of Woodward's findings suggest that different organizational structures were more appropriate with different technologies. However, other noted researchers, such as those from the University of Aston in Birmingham, England reported findings somewhat different from Woodward's (Pugh, Hickson, Hinings, & Turner, 1969). The Aston's research findings appear to suggest that an organization's contextual variable, size, as opposed to technology, is a main factor in the structure of an organization. And, unlike Woodward who simply focused on one contextual factor--namely, technology--to determine structure, the Aston research team examined several other contextual factors that they believed could influence organizational structure, such as technology, size, location, and others.

Thus, organizational theory, with respect to technology and structure, is still an unsettled abstraction fought over by students of organizational technological change theory. The question as to whether organizational structure is dependent on technology and other contextual factors is still unanswered, both in the broader organizational literature and in the human service's sector specifically (Glisson, 1992).

Glisson (1992) has studied the structure-technology relationship with respect to nonprofit human service organizations, as previously mentioned. For example, Glisson, placed technology in a dependent position by distinguishing between two organizational phases--

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phases--namely, that of design and implementation. This approach is consistent with the method in which our organizational decision-making phases are structured, that is, the differentiation between technology (i.e., product or process) and the technological change process with respect to the organizational decision-making phases. However, technology classification in our study is further placed in an independent variable position when studying whether technology (both product and process) influences the structure of the nonprofit human services organization. In accomplishing this analysis, multiple contextual and structural variables are examined.

Contextual Factors

A number of studies, too numerous to identify in this study, have examined the relationship between contextual variables and their influence on organizational structure. Some or all of the following contextual variables have been investigated to determine their influence on organizational structure. For example, technology itself, viewed from both a dependent and independent perspective, has consistently been a difficult concept to clearly distinguish in terms of its role in either a product-oriented or process-oriented sense (Galbraith, 1972; Eveland, 1981; Pacey, 1984; Reshef, 1993; and Tapscott & Caston, 1993; among others).

As contextual studies continued to evolve, some, or all, of these and other researchers continued with their quest in identifying other contextual variables that may influence the organizational structure-technology relationship. For example, Steinhauer's (1988) research indicates that size is highly correlated with an organization's ability to innova

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Controlling for environment is another contextual variable used by scholars to affix a relationship between structure and technology. For instance, Holloway & Brager (1989) claim that an organization's relationship to its environment affects the ability of participants to shape or direct an organization's future direction. Specifically, they examined environment in terms of their hypotheses that the degree to which an organization is independent or dependent on its environment will dictate whether coalition building activities within it will occur. Separate from the way Holloway & Brager viewed environment, other noted researchers have continued to include environment in their lexicon of variables (see, for example, Daft, 1986; Pasmore, 1988; Steinhauer, 1988; Hasenfeld, 1992, among others).

As contextual variables continue to be expanded, they include level of participation, financial commitment, organizational experience, and communication & training, among others. Participation by staff is considered critical as a factor that influences the technological implementation process (Daft, 1986). And, as participation increases, their drive for assisting in mobilizing change increases (Kanter, 1983).

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Although participation appears to be a major contextual variable that affects both the technology and structure, other researchers have included age (or founding) of the organization as well (Blau & Meyer, 1971; Dessler, 1980; among others). Communication and training of staff are perceived as being a significant factor that has an influence on the structure-technology relationship (Daft, 1986; Steinhauer, 1988; Meisel, 1989).

Structural Factors

As we delve deeper into this dimensional rift between hard, product-oriented, and soft, process-oriented technology, we are reminded that the technology in a nonprofit organization does not exist independent from its organizational structure (although, from a philosophical point of view, this can certainly be argued to the contrary). Since the dawn of the first technological breakthrough, historians and philosophers of technology have argued and debated the epistemological and ontological origins of the very nature of technology (Dessauer, 1983; Mitcham & Mackey, 1983; Vig, 1988). And the debate continues . . .

Focusing more on the present Zeitgeist of the time, the debate centers more specifically on testable and measurable variables that are more readily identifiable. Specifically, the literature examined consisted of, but was not limited to, the following structural variables: *complexity, formalization, specialization, hierarchy of authority, centralization, professionalism, and span of control.*

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Organizational complexity, for example, has been viewed by many scholars as having attributes of both a structural and contextual nature. Specifically, however, complexity is typically thought of in terms of vertical differentiation, horizontal differentiation, and spatial dispersion (Page, 1988; Glisson, 1992). It refers to the number of activities or subsystems within the organization. That is, the dimensions of complexity--vertical, horizontal, and spatial--consist of vertical complexity being the number of levels in the hierarchy, horizontal complexity consisting of the number of job titles or departments existing horizontally across the organization, and spatial complexity being the number of geographical locations (Daft, 1986).

Formalization, on the other hand, is more concerned with the identification of rules and regulations (Holloway & Brager, 1989). For example, the formalization of an organizational structure can determine how the organization will be structured given the routine or nonroutine activities of the organization. In other words, "organizations engaged in routine activities are said to be most appropriately structured with high levels of centralization and formalization, whereas those engaged in nonroutine activities are advised to adopt low centralization and formalization" (Weiss, 1989, p. 37; see also Joglekar, 1989).

The examination of the structure-technology relationship must not only include formalization as a dependent variable, but must also incorporate level of specialization into the overall framework. Specialization has been defined as "the degree to which organizational tasks are subdivided into separate jobs" (Daft, 1986, p. 16). Daft further went on to say that "if specialization is extensive, each employee performs only a narrow range of

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The variables of formalization and specialization are further complemented by hierarchy of authority factor. Holloway & Brager maintain that hierarchy of authority is the most important of all structural dimensions. Hierarchy of authority is defined as varying levels in an organization that defines the extent of a person's responsibility and affixes accountability to the person's task. In other words, hierarchy of authority basically describes who reports to whom and the span of control of each manager (Daft, 1986).

The last three variables central to an organizational structural analysis are centralization, professionalism, and span of control. Take, centralization, for example. Centralization is generally viewed in terms of all or most of the authority being maintained at the top (Dessler, 1980). In other words, a centralized structure is where top managers tend to control the decision-making process. However this centralization structure becomes difficult for nonprofit organizations, especially those more grassroots oriented. For example, Drucker (1993) maintains that

> "the need to organize for change also requires a high degree of decentralization. That is because the organization must be structured to make decisions quickly. And those decisions must be based on closeness--to-performance, to the market, to technology, and to all the many changes in society, the environment, demographics, and knowledge that provide opportunities for innovation if they are seen and utilized" (p. 7).

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In effect, Drucker believes that an organization, especially a nonprofit, cannot submerge itself in the community nor subordinate itself to the community's ends. Rather, the organization's own 'culture' has to transcend community (p. 7). That is, nonprofit organizations--specifically--must assume full responsibility for their impact on staff members, their environment, their recipient population, and whomever and whatever it touches. That is its social responsibility (Drucker, 1993)

The issue of centralization, along with the other structural variables, is largely dependent upon controlling for professionalism. Basically, professionalism is the level or degree of formal education and training of staff members (Daft, 1986). Lambright (1979) argues that professionalism is a central ingredient that makes for high intraorganizational capacity to innovate. However, a caveat to this is the last issue, namely, that of the organizations span of control. Weiss' (1989) research shows that the greater the amount of training a professional has the narrower their span of control. In descriptive terms, span of control is the number of people who report to a supervisor/manager (Woodward, 1965; Daft, 1986; Reshef, 1993).

Thus far, each of these structural factors mentioned play a part in the structure-technology relationship. It should become obvious that to analyze this type of dynamic is complicated by the number of variables, both contextually and structurally. The next chapter which follows helps in better understanding how these variables are to be operationalized and measured.

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CHAPTER III

METHODOLOGY

Introduction

This section is concerned with conveying a clear and detailed accounting of the methods undertaken to accomplish this study. The inherent nature and complexity of the issues under investigation in this dissertation leave one to continually question ones own methodological approach or approaches. That is, this study ventures into an unchartered area--namely, that of the technological change process in the nonprofit human services sector. Therefore, the decision to choose this particular approach is based on this researcher's conceptualization.

Due to the inherent intricacies of this particular study, it was decided that the collection of primary data would be the most appropriate. The quantitative data obtained for this study came from administering a survey questionnaire to 590 nonprofit human service organizations throughout the State of Michigan. During the month of August 1994, the survey instrument was mailed to executive directors of each human service organization. Because the executive directors are theoretically the most knowledgeable of their organizations and all of its detailed workings, they were considered to be the most appropriate.

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Moreover, in order to obtain the widest possible variations of technological change in the nonprofit human services sector and as rich and diverse a source as possible, it was decided to utilize the entire population of Michigan nonprofit human service organizations, with respect to nonprofits who complete a 1990, IRS 990 form (to be discussed in more detail later). An early assumption was that anything less than the entire population would not only have methodological problems in sample selection and stratification, but, also, that different organizations in different communities may perceive technology quite dissimilarly, thereby skewing overall state representation.

Unit of Analysis

The relationship between technology and organizational behavior can be examined at three different levels of analysis: the individual, the unit or department, and/or the organization (Pasmore, 1988). For our purposes, the organization is the unit of analysis for this study.

Types and Operationalization of Variables

The variables identified in this section are organizational in nature. The contextual factors will operate as the primary independent and control variables; whereas the organizational structural variables will be held as dependent variables.

1 *Technology*.

a) *Product-oriented (Hard)*. Product-oriented technology will be measured by providing a list of tangible information-based technological asking

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products used in the physical processing of information. This will include computer-based hardware and software.

b) *Process-oriented (Soft)*. Process-oriented technology was measured by providing a list of intangible organizational and human resource activities for the respondent to identify. This type of technology is based on the organizational and systematic means of accomplishing tasks. This will also be synonymous with organizational development.

2. *Perception of Technology*. Perception of technology was measured by asking respondents what type of product-oriented or process-oriented technology is (1) available or (2) used by the organization.

3. *Technological Change Process*. Technological change is multidimensional and difficult to define and operationalize. Reshef (1993) and others maintain that thorough definitions should emphasize different aspects of technological change (Reshef, 1993), such as the process listed below. However, our analysis builds on these processes by asking a series of questions concerning employees/staffs participation in the technological change decision-making process. This was measured by the use of a five (5) point scale consisting of : 1) No decision making, 2) Blank/not defined, 3) Moderate decision making, 4) Blank/not defined, and 5) Great decision making. The level of technological change was measured within the following four (4) levels:

a) *Innovation*. Innovation is defined, for purposes of this study, as any product or process which is newly integrated into the organizational structure or processes. Innovation was measured by the use of a Likert decisi

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scale answered by the respondents.

b) *Adoption*. Adoption is defined, for purposes of this study, as the decision to allocate time, financial, and/or human resources to a particular new product-oriented or process-oriented technology (see Lambright's, 1979, modified variation on definition). Adoption was measured by the use of a Likert scale answered by the respondents.

c) *Implementation*. Implementation is defined, for purposes of this study, as the trial usage of the product-oriented or process-oriented technology (see Lambrights, 1979, modified variation on definition). Implementation was measured by the use of a Likert scale answered by the respondents.

d) *Transference*. Transference was defined, for purposes of this study, as the spatial location of a product-oriented or process-oriented technology either intraorganizationally or interorganizationally. Transference was measured through the use of a Likert scale and categorical listing.

4. *Organizational Decision-Making Phases/Processes*. The organizational decision-making phase is defined, for purposes of this study, as the process (i.e., phases) employees/staff of the organization go through when their considering product-oriented or process-oriented technological change. A series of questions was asked as to what level do employees/staff participate in the decision-making process. This was measured by the use of a five (5) point scale consisting of : 1) No decision making, 2) Blank/not defined, 3) Moderate decision making, 4) Blank/not defined, and 5) Great decision making The

level of decision-making was measured by the following five (5) phases:

a) *Conceptualize*. Conceptualization was defined, for purposes of this study, as the abstract process of defining the type of technological change to be integrated in the organizational structure. Conceptualization was measured by developing categorical activities and through the use of a Likert scale.

b) *Design*. Design was defined, for purposes of this study, as the specific activities written to identify the attributes of the type of technology to be integrated in the organizational structure for technological change. Design was measured by developing categorical activities and through the use of Likert scales.

c) *Implementation*. Implementation was defined, for purposes of this study, as the usage of specific decision-making activities identified for technological change. Implementation was measured by developing categorical activities and through the use of Likert scales.

d) *Monitoring*. Monitoring was defined, for purposes of this study, as the specific phases and activities identified and observed in the technological change process. Monitoring was measured by developing categorical activities and through the use of Likert scales.

e) *Evaluate*. Evaluate was defined, for purposes of this study, as the specific techniques used to determine level of integration of technological change into the organizational structure. Evaluation was measured by developing categorical activities and through the use of Likert scales.

5. *Contextual Factors.* Contextual factors are defined, for purposes of this study, as dimensions which characterize and describe the whole organization because of their influence on the structural dimensions of the organization (Daft, 1986). The contextual factors was measured by focusing on the whole organization by identifying the following variables:

a) *Technology.* Already operationalized *supra.*

b) *Size.* Size was measured by asking respondents to provide information on: (1) overall number of full-time, (2) part-time, (3) volunteers, (4) board members, (5) total budget, and (6) net assets.

c) *Environment.* Environment was measured by asking respondents to indicate, through the use of a Likert scale, the relationship the organization has to (1) the recipients they serve and (2) the community in which the organization is located.

d) *Geographical Area Served.* Geographical area served was measured by providing respondents a list of spatial ranges and asked to indicate the approximate geographical area of the population served.

e) *Location.* Location was measured by asking respondents to indicate the number of sites the organization controls.

f) *Participation.* Participation was measured by asking respondents to indicate the approximate number of recipients who participate in the services provided, and, in addition, was asked to indicate the number of organizational members who participate in the technological change and organizational decision-making phase process.

g) *Financial commitment*. Financial commitment was measured by asking respondents to indicate the approximate (1) amount of capital committed to product purchases and (2) process related training. Moreover, Likert type scales were developed to measure the perception of the respondents to financial commitment by the board of directors and foundations.

h) *Organizational experience (age)*. Organizational experience (age) was measured by asking the respondents to indicate when the organization was established/founded.

i) *Communication and training*. Communication and training was measured together by asking respondents to indicated, through the use of a Likert scale and by providing a list of activities, level and form organizational communication and training.

j) *Race and ethnicity*. Race and ethnicity were measured by asking the respondents to indicate from a list of racial and ethnic classifications the overall racial and ethnic composition of the (1) board of directors, (2) employees, (3) management, (4) nonmanagement, including (5) full-time, (6) part-time, (7) the recipients the organization serves, (8) the community in which they are located, and (9) the respondent's self-reported racial origin.

k) *Gender.* Gender was measured by asking the respondents to indicate the overall gender composition of the (1) board of directors, (2) employees, (3) management, (4) nonmanagement, including (5) full-time, (6) part-time, (7) the recipients the organization serves, and (8) the respondents self-reported gender.

6. *Structural Factors.* Structural factors are defined, for purposes of this study, as the way the organization divides labor or differentiates its organizational components. The structural variables can be more separately and specifically identified as follows:

a) *Formalization.* Formalization was measured by providing respondents with a list of various types of procedures and rules and were asked to indicate their perception as to the level of formalization, as measured through the use of a Likert type of scale.

b) *Specialization.* Specialization was measured through the use of a Likert type of scale by asking respondents to identify whether staff perform a wide or narrow range of tasks.

c) *Hierarchy of authority.* Hierarchy of authority was measured by asking respondents to indicate (1) how many levels of authority are in the organization and (2) how many individuals they report to.

d) *Centralization.* Centralization was measured by asking respondents to indicate (1) the number of organizations under the same organizational structure and (2) whether they perceive power and control to be hierarchical or distributed throughout the organization, which was measured through the use of a Likert scale.

e) *Professionalism*. Professionalism was measured by asking respondents to indicate through the use of a Likert scale the different levels of education for the (1) board of directors, (2) management, (3) employees, (4) volunteers, and (5) themselves.

f) *Span of control*. Span of control was measured by asking respondents to indicate (1) the number of individuals reporting to the executive director.

g) *Complexity*. Complexity was first measured by providing respondents with lists of product-oriented and process-oriented technology, then asked to indicate through the use of a Likert scale their perception of the technological level of complexity. Second, organizational complexity was measured by other, aforementioned measures already discussed.

Hypotheses

The hypotheses articulated in this study follow a logical process in testing the dimensions of this technological change model as shown in figure 1 *supra*. Four research clusters will examine the multidimensionality of the model under study.

Research Cluster 1: Availability of Technology: Product-Oriented and Process-Oriented

Hypotheses 1 thru 7 are socio-technologically based. That is, researchers such as Pasmore (1988) and Davenport (1993) strongly urge the integration of both product-oriented and process-oriented technology. These hypotheses attempt to strike a balance between the divergent nature of technologies. The ideal type of technological structure is one that mergers the two technologies at various stages of decision-making in specific and the technological change process in general.

Correlational Hypotheses

Hypothesis 1:
The availability of computer-based technology will be a statistically significant correlation with the availability of organizational development strategies.

Hypothesis 2:
The availability of computer-based technology will be a statistically significant correlation with product-oriented technological change processes.

Hypothesis 3:
Statistically significant differences will exist between computer-based technology and organizational development strategies as they are correlated with specific technological change processes.

Hypothesis 4:
Computer-based hardware will correlate significantly with product-oriented decision-making while organizational development will correlate significantly with process-oriented decision-making.

Hypothesis 5:

Racial and gender differences will show statistically significant correlations with both computer-based technology and organizational development strategies.

One-Way Analysis of Variance (ANOVA) Hypotheses

Hypothesis 6:

Organizations who have available desktop computers will report significant differences in staff participation in overall product-oriented technological changes and decision-making processes than organizations who do not have desktop computers.

Hypothesis 7:

Organizations who have available strategic planning will report significant differences in staff participation in overall product-oriented technological changes and decision-making processes than organizations who do not have strategic planning.

Research Cluster 2: The Technological Change Process: Innovation, Adoption, Implementation, Transference.

Hypotheses 8 thru 15 address the issue of organizational structure and the technological change process. This is a particularly difficult issue to address, since most organizational and technological change theorists are undecided as to the nature of organizational structure, or the nature of technology, on the technological change process (Blau & Meyer, 1971; Eveland, 1981; Daft, 1986; Mandell, 1986; Kanter & Summer, 1987; Kramer, 1987; Steinhauer, 1988; Glisson, 1992; Hasenfeld, 1992; Drucker, 1993).

Hypotheses 16 thru 21 are specifically designed to test whether supporting the technological change by organizational personnel depend on their levels of participation in the decision-making process, as perceived by the executive director. A substantial body of research maintains that the earlier employees participate in the decision to bring about technological change, the more they will support the change (Kanter, 1983; Daft, 1986; Pasmore, 1988; Barenbaum & Coleman, 1989; Glisson, 1992; Reshef, 1993). These two hypotheses are intended to assist in expanding the body of knowledge in terms of managements perceptions of personnel involvement.

Correlational Hypotheses

Hypothesis 8:
The overall relationships between the technological change and decision-making processes will be statistically significant.

Hypothesis 9:
Support for computer-based technological change will be correlated more significantly with the overall technological change process than support for organizational development change.

One-Way Analysis of Variance (ANOVA) Hypotheses

Hypothesis 10:
There are differences within and between the overall technological change and decision-making processes combined on the level of support for computer-based technological and organizational development change.

Hypothesis 11:
There are differences within and between the overall product-oriented and process-oriented technological change and decision-making processes on the level of support for computer-based technological and organizational development change.

Hypothesis 12:

There are statistically significant differences within and between specific product-oriented and process-oriented technological change processes on level of support for computer-based technological change.

Hypothesis 13:

There are differences within and between specific product-oriented and process-oriented technological change processes on level of support for organizational development change.

Research Question 3: **The Decision-Making Process: Conceptualization, Design, Implementation, Monitor, Evaluation.**

These hypotheses are specifically designed to test whether supporting the technological change by organizational personnel depend on their levels of participation in the decision-making process, as perceived by the executive director. A substantial body of research maintains that the earlier employees participate in the decision to bring about technological change, the more they will support the change (Kanter, 1983; Daft, 1986; Pasmore, 1988; Barenbaum & Coleman, 1989; Glisson, 1992; Reshef, 1993). These two hypotheses are intended to assist in expanding the body of knowledge in terms of managements perceptions of personnel involvement.

Correlational Hypotheses

Hypothesis 14:

Support for computer-based technological change will be correlated more significantly with specific product-oriented decision-making processes than support for organizational development change.

One-Way Analysis of Variance (ANOVA) Hypothesis

Hypothesis 15:

There are differences within and between product-oriented decision-making processes on the level of support for computer-based technological change.

Research Cluster 4: Attitude Toward Computer-based Technology and Organizational Development Strategies.

The hypotheses developed thus far are intended to test whether organizations are more product-oriented or process-oriented in nature. In other words, an attempt is to try and determine whether nonprofit human service organizations are structured in a technologically predictable way. The latter hypotheses move outward from the model and incorporate more exogenous and descriptive factors in determining their technological nature. For example, hypotheses 7 and 8 are directly concerned with two specific variables: financial resources and race/ethnicity.

Correlational Hypothesis

Hypothesis 16:

Attitude toward computer-based technology and organization development strategies will correlate significantly with race, gender, hardware and organizational development strategies available, technological change and decision-making, and the amount of budget spent on computer-based and organizational development training.

One-Way Analysis of Variance (ANOVA) Hypothesis

Hypothesis 17:

There are differences between genders and their attitude toward computer-based technology and organizational development strategies.

Regression Hypothesis

Hypothesis 18:

The attitude toward computer-based technology and organizational development strategies correlate significantly with organizational characteristics for such variables as hardware, software, and organizational development strategies available, gross revenue, and percent of budget spent on computer-based and organizational development training.

In sum, these overall hypotheses represent only a small fraction of other, more exogenous variables needing to be examined. The testing of additional relationships was conducted during the data analysis phase.

Research Design

The purpose of this study is to examine the overall technological change process in the Michigan nonprofit human services sector. More intrinsic to the nature and purpose of this study is to explain 1) the technological change process (i.e., innovation, adoption, implementation, and transference) occurring in either product-oriented and process-oriented technology; 2) the relationship between the technological change process and the organizational decision-making phase process (i.e., conceptualization, design, implementation, monitoring, and evaluate); 3) the effect of the nonprofit organization's contextual and structural factors have on the technological change and organizational decision-making phase process; and 4) whether nonprofit organizations can effectively be classified as either product-oriented, process-oriented, or a combination of both, and, if so, what effect this will have on technological change overall. Thus, because of the inherent complexity and multidimensional nature of this study, the purpose of this particular survey research design is twofold: descriptive, and explanatory. Descriptive because little is known about the problems under investigation and exploratory because it tests relationships between variables (Singleton, Straits, & Straits, 1993, p. 93).

Instrumentation

The entire population of Michigan nonprofit human service organizations was chosen. The survey instrument was sent to the nonprofit executive directors. Since individual names were not included in our sampling frame (to be explained more fully *infra*), the introductory letter and the letter of support will simply refer to the executive director of the nonprofit human service organization in general. Moreover, the overall mailing will include: 1) Letter of introduction concerning the research and survey (which both will include instruments on how to complete the survey and process the responses); 2) The survey instrument itself; 3) Letters of support by Mr. Dave Egner, Executive Director of the Michigan Nonprofit Forum; Ms. Ann Marston, President and Chief Executive Officer of the Michigan League for Human Services; and Ms. Jeanne Vogt, President of the Accounting Aid Society; and 4) a pre-stamped envelope for returning the survey instrument. Suggestions on the questionnaire were reviewed by key nonprofit scholars and noted statewide nonprofit practitioners, and, as deemed appropriate and conducive for the study at hand, some changes were made.

In the survey instrument, respondents were asked to complete questions in five major areas. First, what their observation and perception of the types of technology available, needed, and used or would be used by their organization. The respondents were asked to differentiate between product-oriented and process-oriented technology. Second, respondents were asked how they perceive or observe decisions being made to bring about technological change. Third, respondents were also asked questions about the structure of their organization. Fourth, contextual questions were asked to the respondents concerning their external environment/demography--that is, their community and the population they serve. And finally, respondents were asked contextual questions about themselves.

The variables identified as important for examining technology and the technological change process were used to construct the questionnaire. The survey questionnaire will include product-oriented and process-oriented technology variables; variables that specifically address a perceptual understanding of the technological change process--specifically, innovation, adoption, implementation, and transference; organizational phase variables in the decision-making process, such as, conceptualization, design, implementation, monitoring, and evaluation; organization contextual and structural variables; and demographic variables.

Rather than randomly pretesting the survey instrument with only a small number of selected organizations, it was decided that scholars and practitioners versed in the nonprofit arena be used to critically review the questionnaire. This is an appropriate method in validating the reliability of the instrument, especially since there were preliminary interviews (Singleton, Straits, & Straits, 1993, p. 121). The depth in examination was far greater and more detailed. A limitation of pretesting an instrument is the cursory review provided by the few respondents who return the instrument. The survey instrument is expected to be sent to respondents around the first or second week of August 1994. After ten days respondents were contacted via a postcard to remind them that the survey was sent and to request their response.

Reliability of the Questionnaire

The Cronbach alpha reliability coefficient (Mehrens & Lehmann, 1994) was used to estimate the internal consistency measure of the reliability of the questionnaire regarding the availability of product-oriented and process-oriented technology, the process of technological change and decision-making, and attitude toward computer-based technology and organizational development strategies. Specifically, the following alpha reliability coefficients were obtained:

Table 3.0 Scale Items

Items Constructs	Alpha	N items
Availability of Technology		
Computer-based hardware	0.83	(12 items)
Computer-based software	0.80	(16 items)
Organizational development strategies	0.87	(10 items)
Overall Technological and Decision-Making Process	0.98	(40 items)
Technological Change Process		
Innovation	0.95	(10 items)
Adoption	0.96	(10 items)
Implementation	0.95	(10 items)
Transference	0.96	(10 items)
Decision-Making Process		
Conceptualization	0.95	(8 items)
Design	0.96	(8 items)
Implementation	0.96	(8 items)
Monitor	0.96	(8 items)
Evaluation	0.97	(8 items)
Attitude Toward the Use of:		
Computer-based technology	0.90	(18 items)
Organizational development strategies	0.90	(18 items)

N=110 Cases overall

Thus, in examining the various constructs, the multiple items used to develop each index reflect high reliability. That is, Cronbach's alpha ranges from 0 to 1.0, thereby indicating how much the items in an index are measuring with respect to their consistency. Overall the items appear to be measuring what they were designed to measure. However, the availability constructs, although high, are still somewhat lower overall. This may be due, in part, to how the scales were developed and the items selected.

Confidentiality and Anonymity

The cover letter, letters of support, and the survey instrument itself will each indicate that respondents will not be identified by individual or organization. Specifically, all the responses were treated as confidential and each organization will maintain its anonymity. Each respondent was asked to mail the instrument in the self-addressed stamped envelope provided. Respondents were informed that the code to be identified on the survey will only be used for identifying which surveys were returned, so as to enable the researcher to send postcards as reminders of the survey.

Survey Design

The survey design can be conceptualized as a three-tiered perceptual study of technological change in nonprofit human service organizations. The first tier being that of technological definition and classification between product-oriented (i.e., hard) and process-oriented (i.e., soft) technology. Secondly, this tier focuses on more detail toward the technological change process in the organizational decision-making phases. And the third tier examines more contextual and structural organizational variables as they are related to various types of technology.

The survey study was cross-sectional in nature because it was administered at one point in time. The descriptive and explanatory nature of this study lends itself to incorporating both descriptive questions and explanatory perceptual questions. More specifically, this two dimensional survey design will enable the researcher to first describe and identify variables relevant to understanding technology in the nonprofit human services sector. Based on the second dimensional quality of the survey design, this will allow the researcher to make inferences about the nonprofit human services statewide. Relational tests and inferences was limited to perceptions about: 1) the nature of technology in the human services sector, 2) the linkage between the technological change process and organizational decision-making, and 3) effects of contextual and structural organizational variables on the technological change and organizational decision-making process. Finally, the survey instrument is designed to be completed by the executive director of the organization. Questions in the survey will come from the perceptions and description of this one person.

Population

The population for this study consisted of all nonprofit organizations in Michigan that filed Internal Revenue Service (IRS) 990 forms in 1990 declaring themselves to be human service organizations, as reflected in their indicating a 'P' classification code, per the National Taxonomy of Exempt Entities (NTEE). The 'P' classification code is identified as "Human Service, Other/Multi-Purpose" nonprofit organizations. More specifically, a subsequent smaller population grouping was chosen because of the inherent difficult of analyzing this complex human services sector (For more detail as to why the smaller population was chosen, please refer to the section entitled "Rationale for Population Selection and Sampling").

That is, for Michigan, 1265 nonprofit organizations classified themselves as "Human Service, Other/Multi-Purpose." From this 1265, sixty-two 'P' subclassifications were identified, clustering within seven major groups: P20 (Human Service Organizations--Multipurpose), P30 (Children's and Youth Services), P40 (Family Services), P50 (Personal Social Services), P60 (Emergency Assistance (Food, Clothing, Cash), P70 (Residential/Custodial Care (Group Home), and P80 (Services to Promote the Independence of Specific Population Groups). It was subsequently recommended that three major groups be selected as part of the smaller population: P20 (Human Service Organizations--Multipurpose), P30 (Children's and Youth Services), P40 (Family Services). Therefore, 590 nonprofit human service organizations were studied from this population grouping.

Sampling Frame

A sampling frame of the 1990 population of nonprofit human service organizations in Michigan was obtained from the Michigan Nonprofit Project, Michigan State University. The Michigan Nonprofit Project data of Michigan human service organizations were provided by the Michigan Employment and Securities Commission (MESC). Specifically, 1265 nonprofit human service organizations represent the population of nonprofit organizations which filed Internal Revenue Service (IRS) 990 forms and declared themselves to be human service organizations (i.e., reported a 'P' National Taxonomy of Exempt Entities (NTEE) code). The sampling frame consists of the following fields: NTEE code, organization name, reported mailing address, city, zipcode, county, assets ($), income ($), expenditure code and public support code.

Rationale for Population Selection and Sampling

The purpose for narrowing our population of 1265 nonprofit human service organizations to a population of 590 was primarily due to the diversity in purposes and activities in the human services sector, as reflected in the NTEE coding classification. Gronbjerg (1993) stresses the difficulty in analyzing or interpreting trends in different categories of the NTEE taxonomy--especially in the nonprofit human services sector. Keeping this in mind, it was subsequently determined that by narrowing the pool of human service organizations to those which focus more on the health and safety needs of families, in general, and children and youth, in specific, would reflect more of the basic tenets of the human services sector.

Conversely, the decision not to include human service organizations that were involved more in advocacy, individual personal services, or residential custodial care will enable our analysis to be more focused on the basic needs of family and youth. Otherwise, if all human service organizations had been included, regardless of purpose or activities, it would have required that all recipients of human services be collapsed together in our analysis. This may have confused our analysis. Because, it is generally agreed by most scholars that human service organizations normally have multiple goals, problematic in integrated analysis, and that analyzing trends across the human services sector without finding common purposes may result in misrepresenting the sector (Kramer, 1987; Hasenfeld, 1992; Gronbjerg, 1993).

It should be noted, however, that our reduced population group of children and youth services (P30), for example, consists of 329 human service organizations. Within this population there are 187 child day care organizations (i.e., P33). Because child day care services are considered more generalists in nature, with respect to other, more specific human service organizations (Tucker, Baum, & Singh, 1992, p. 51), it was decided to conduct a systematically random sample on this population. A random ordering of the 187 organizations was conducted via a Lotus spreadsheet program whereby every tenth day care organization was selected, totaling eighteen overall. As mentioned earlier, this brings our overall population size to 590 nonprofit human service organizations.

Statistical Analyses

When data are collected and/or coded various statistical analyses were used in order to test the hypotheses. Given the nature of this study, most of the variables are likely to be nominal and ordinal, with few variables being either interval or ratio (for example, amount of income, assets, number of employees, volunteers, among others). Therefore, the statistics utilized were both nonparametric and parametric. Our computational algorithm was the Statistical Package for the Social Sciences 6.0 for Windows (SPSS for Windows). Finally, due to the difficulty of precision in a study of this type, an alpha level is set at .05 ($p < .05$), so as to try to avoid a type two error.

Limitations

The first major limitation is the fact that only the executive director was surveyed. Ideally, in any organizational analysis, respondents at multiple level in the organization should be contacted. However, all else being equal, with the organization being the unit of analysis, and, theoretically, with the executive director being the most informed about the overall operation of the organization, the decision to use the executive director as the respondent was most appropriate, academically as well as practically.

In addition, only human service organizations were studies, thereby reducing the likihood for broad-based nonprofit comparisons. The generalizability stems to nonprofit human service organizations specifically. Other nonprofits, different in purpose and function, will not be able to be compared as easily. Though these comparison limitations are debatable in the community of scholars, we opt to follow conventional interpretation of subgroup comparisons.

CHAPTER IV

PRESENTATION AND ANALYSIS OF THE DATA

Introduction

Thus far, we have described, in detail, the methods used to obtain, organize and analyze the data. Now, we will turn our attention to the overall thesis of this research, namely, that of distinguishing between the various dimensions of product-oriented and process-oriented technology. The results from this study are divided into five major components with hypothesis testing being reflected in the second thru the fifth component. The components to be discussed are as follows: 1) demographic characteristics of the sample of nonprofit human service organizations under study; 2) the availability of either product-oriented or process-oriented technology; 3) perceived support for the technological change process (i.e., innovation, adoption, implementation, and transference); 4) perceived support for the decision-making process (i.e., conceptualization, design, implementation, monitor, and evaluation); and 5) attitude toward computer-based technology and organizational development strategies. Each of these components within this study follows a logical progression in terms of how this product-oriented and process-oriented technological change and decision-making models should be examined. Moreover, as implicitly indicated, this model has three major dimensions (i.e., technology type (product or process), technological change, and decision-making). Across each major dimension has been our attempt at distinguishing between product-oriented and process-oriented organizational structures, products, processes, and attitude. In short, this model was tested using various inferential statistical techniques. The computational algorithms used to analyze the data was SPSS 6.0 for Windows (Statistical Package for the Social Sciences). The statistics used for this particular study were crosstabulations, correlations, t-test (both independent and pairwise) and one-way analysis of variance (ANOVA), and regression.

Characteristics of Nonprofits Sampled

The findings from this study are the result of 590 questionnaires that were mailed to executive directors of nonprofit human service organizations throughout the State of Michigan. From this sample surveyed, approximately 87 questionnaires (or 17%) were returned with no forwarding address. Thus, from the 503 organizations that received the questionnaire, approximately 22% (N=110) responded and returned the completed questionnaire.

Respondents' Characteristics

Table 4.0 provides a detailed breakdown of the respondents' characteristics. They range from 21 to 75 years of age. Not surprising however is that 53 (50%) of the respondents fell between the ages of 42 and 53, while over 68% indicated they have been affiliated with the organization for over six years. In effect, this represents a very stable population of nonprofit executives who had chosen to respond to this study.

With respect to the gender and racial breakdown of this study, 88 (83.8%) of respondents were European American, with males comprising over 43% and females 40%, while African American and other racial groups accounted for a little over 16%. The education of respondents reflects a rather educated nonprofit workforce. That is, 41.1% have a master's degree while 33.7% hold baccalaureate degrees while over 78 (72%) are employed with the organization on a paid full-time basis. Moreover, over 55% of the salaries paid to executive directors fall between $35,000 and $75,000.

**Table 4.0*	Respondents' Characteristics**

	N	Percent
Age		
21 - 41	27	25.5
42 - 53	53	50.0
54 - 75	26	24.5
Years Affiliated with the Organization		
1 or less	15	14.0
2 to 5	19	17.8
6 to 10	30	28.0
11 to 20	32	29.9
21 or greater	11	10.3

	Percent Male	(N)	Percent Female	(N)
Race/Ethnicity				
European American	43.8	(46)	40.0	(42)
African American	3.8	(4)	5.7	(6)
Asian American	1.9	(2)	1.0	(1)
Latino American	1.0	(1)	1.0	(1)
Native American	--		1.0	(1)
Other	--		1.0	(1)
Education				
High School	.9	(1)	1.9	(2)
Trade/vocational	.9	(1)	--	
Some college	.9	(1)	5.6	(6)
2-year associate	2.8	(3)	3.7	(4)
Bachelor's degree	18.7	(20)	15.0	(16)
Master's degree	19.6	(21)	21.5	(23)
Ph.D. or equivalent	6.5	(7)	.9	(1)
Other	.9	(1)	--	
Salary of Executive Directors				
$20,000 or less	8.4	(8)	7.4	(7)
$20,001 to $35,000	9.5	(9)	13.7	(13)
$35,001 to $50,000	13.7	(13)	13.7	(13)
$50,001 to $75,000	15.8	(15)	12.6	(12)
$75,001 to $150,000	4.2	(4)	1.1	(1)

Table 4.0 (cont'd)

	Percent Male	(N)	Percent Female	(N)
Main Position in Organizations				
Full-time paid	38.0	(41)	34.3	(37)
Part-time paid	1.9	(2)	3.7	(4)
Regular volunteer	6.5	(7)	5.6	(6)
Board member	3.7	(4)	4.6	(5)
Other	.9	(1)	.9	(1)

* Some N's will not equal 110 because of missing responses.
Note: Valid percentages (i.e., excluding missing values) are used to better reflect the actual percentage of those respondents who answered the questions.

Organization's Characteristics

The year the organizations were established ranged from 1879 to 1990; whereas, over 56% where established within the past 20 years, as indicated in Table 4.1. The year the nonprofit was established may partly explain the fact that the average number of full-time paid employees is 51. This, by far, exceeds the overall nonprofit sector in general and human services sector in specific. That is, Wilson (1991) indicates that in Michigan, fewer than 3,000 nonprofits employed one or more persons. Given that is the case, it appears that the sample population comes from a disproportionate (or skewed) segment of the nonprofit sector. Some of the other data indicates that over 50% of the employees are part-time while a little less than 50% have fewer than 20 regular volunteers.

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Table 4.1* **Organization's Characteristics**

	N	Percent		
Year Established				
1879 to 1938	19	21.6		
1940 to 1969	19	21.6		
1971 to 1980	19	21.6		
1981 to 1990	31	35.2		
Number of Staff/Volunteers				
Full-time paid				
3 or less	23	25.3		
4 to 12	22	24.2		
13 to 31	22	24.2		
35 or greater	24	26.4	**Mean**	**Total**
Total overall			51	4,700
Part-time paid				
2 or less	21	24.4		
3 to 6	21	24.4		
7 to 25	20	23.3		
30 or greater	24	27.9	**Mean**	**Total**
Total overall			37	3,250
Regular volunteers				
4 or less	15	18.5		
5 to 20	25	30.9		
25 to 50	20	24.7		
58 or greater	21	25.9	**Mean**	**Total**
Total overall			125	10,312
Overall volunteers				
15 or less	16	25.0		
20 to 40	12	18.8		
50 to 130	20	31.3		
150 or greater	16	25.0	**Mean**	**Total**
Total overall			228	14,575
Total recipients of services				
300 or less	23	24.7		
350 to 1,500	21	22.6		
2,000 to 9,000	24	25.8		
10,000 or greater	25	26.9	**Mean**	**Total**
Total overall			26,679	2,507,861

Table 4.1 (cont'd)

	N	Percent		
Geographical area served				
County or larger region	73	68.2		
Area smaller than a county but larger than a municipality	14	13.1		
Whole city, township, or village	11	10.3		
City sub-area >25,000 people	5	4.7		
City sub-area <25,000 people but >5,000	3	2.8		
City sub-area <5,000	1	.9		
Financial resources and liabilities				
Gross annual expenses				
$112,000 or less	23	25.3		
$120,000 to $387,000	23	25.3		
$432,800 to $1,620,000	22	24.2		
$2,060,000 or greater	23	25.3	**Mean**	**Total**
Total overall			$2,230,467	$205,202,954
Gross annual revenues				
$112,000 or less	23	25.6		
$115,000 to $418,900	23	25.6		
$450,000 to $1,550,000	21	23.3		
$1,650,000 or greater	23	25.6	**Mean**	**Total**
Total overall			$2,045,883	$186,175,390
Total assets				
$19,000 or less	20	24.4		
$20,000 to $150,000	21	25.6		
$168,000 to $1,045,853	20	24.4		
$1,250,000 or greater	21	25.6	**Mean**	**Total**
Total overall			$1,716,468	$142,466,873
Total liabilities				
$6,090 or less	35	48.6		
$9,200 to $142,384	19	26.4		
$192,482 or greater	18	25.0	**Mean**	**Total**
Total overall			$417,585	$30,483,763

* Some N's will not equal 110 because of missing responses.

Unlike most nonprofits which are very grass-roots and apply their philanthropy and altruism to neighborhoods, the respondents in this study, approximately 68%, indicated that the geographical area they serve is a "county or larger region." Whereas over 50% have gross receipts, expenditures, and assets less than $387,000, $418,900, and $150,000, respectively. In sharp contrast to these figures, total liabilities for approximately 48% of the organizations are less than $6,090 or less.

The descriptions provided about the respondents and the organizations are, by conventional standards, somewhat routine for most studies. However, Table 4.2a, 4.2b, and 4.2c provide descriptive information more oriented to the very nature of this study, such as the amount of hardware, software, and organizational development strategies available within the organizations under study. Table 4.2a, for instance, shows that most of the more routine computer-based hardware, such as desktop computers (85%), laser/ink jet printers (75.2%), and hard drives (88.6%) are currently available. Whereas, in contrast, some of the more sophisticated hardware used to complement and upgrade computer-based technology is available but to a much lesser extent, such as color printers (16.5%), scanners (21%), and CD-ROMs (23.8%).

Table 4.2a Availability of Hardware Technology Within the Organization*

	Percent Available	N
Desktop computer	85.0	91
Portable computer	27.2	28
Laser or ink jet printer	75.2	79
Color printer	16.5	17
Dot matrix printer	74.0	77
Color monitor	70.5	74
Modem	54.3	57
Hard drive	88.6	93
Tape backup drive	52.9	55
Scanner	21.2	22
CD-ROM	23.8	24
Mouse	79.6	82

* N = 110 overall valid percent used.

Table 4.2b also indicates that some of the more routine computer-based software is available, such as spreadsheets (86.3%), word processing (90.2%), financial/accounting (84.5%), and database management (66.7%) software. Note, however, that although software programs such as that of desktop publishing (52.9%), statistical packages (33.7%), and presentation graphics (43.6%), for instance, are somewhat less in terms of their availability, it may be a reflection that the more unconventional software packages are just now beginning to enter into mainstream nonprofit organizational structures. Not surprising however is the fact that some of the most important technology to help advance the nonprofit sector into the 21st century technologically is available in only a few of the organizations being examined. For example, tax planning (6%), multimedia packages (7.1%), electronic mail (19.1%), and Internet services (10%) are but a few examples of the type of software packages that currently exist within this sample, but which are slow in being incorporated into nonprofit organizations in general and human service organizations in specific.

Table 4.2c summarizes the type of organizational development strategies available and practiced. Accounting and bookkeeping, comprising 94.9% of the organizations under study, appears to dominate in availability. The next two highest in their availability is in the areas of financial management and grant proposal writing strategies, accounting for approximately 83.7% and 72.4%, respectively. In closer examination, it becomes quite obvious that organizational strategies oriented toward capital acquisition and maintenance dominate. This is not that surprising since the gross revenues, expenses, and assets previously discussed are rather substantial, relative to other nonprofits within the sector. Finally, strategic planning ranked fourth (71.7%) in its availability in the organizations. Intuitively, this, too, is not that unusual since few organizations even practice strategic planning or have available materials on the subject (Odiorne, 1984).

The next four sections which follow begin focusing on the hypotheses under study. First is the availability of technology relative to the organizations and their technological change and decision-making processes. Second, we will more closely examine our hypotheses with respect to the unique qualities of the technological change process and the supportive nature of the organizations in technological and organizational development change. The third section will address, in specific terms, the decision-making process and how supportive organizations are in technological and organizational change. Finally, our hypothesis testing will conclude with how attitudes in the use of computer-based technology and organizational development are related in terms of the organization's overall structure.

Table 4.2b Availability of Software Technology Within the Organization*

	Percent Available	N
Spreadsheet	86.3	88
Painting/drawing	36.6	37
Presentation graphics	43.6	44
Word processor	90.2	92
Financial/accounting	84.5	87
Entertainment/education	28.6	28
Desktop publishing	52.9	54
Database management	66.7	68
Tax planning/presentation	6.0	6
Computer-aided design	10.9	11
Personal information manager	23.8	24
Statistical programs	33.7	33
Multimedia package	7.1	7
Electronic mail	19.0	19
Internet service	10.0	10

*N = 110 overall valid percentage used.

Table 4.2c Availability of Organizational Development Strategies within the Organization*

	Percent Available	N
Strategic planning methods/techniques	71.7	71
Financial management	83.7	82
Accounting and bookkeeping	94.9	94
Grant proposal writing	72.4	71
Project/program feasibility study	43.9	43
Human resource planning	48.0	47
Fundraising development planning	65.3	64
Project planning	63.3	62
Operations planning	63.3	62
Project/program evaluation	70.1	68

* N = 110 overall valid percent used.

Research Cluster 1: Availability of Technology: Product-Oriented and Process-Oriented.

The overall research question to be examined is whether the availability of either computer-based technology or organizational development strategies measurably influences the technological change and decision-making process. This section utilizes two statistical techniques, correlations and one-way ANOVA , to assist in answering this broad research question. Our first correlational hypothesis section will focus more specifically on the availability of three clusters of technology (i.e., hardware, software, and organizational development) and correlate them with the technological change and decision-making processes, as well as with gender, race, and age of the organization.

Correlational Hypotheses

Hypothesis 1:

The availability of computer-based technology will be a statistically significant correlation with the availability of organizational development strategies.

Table 4.3a shows the Pearson product moment correlations among the measured variables. The three technologies are all positively correlated and are statistically significant at an alpha .05 level. In short, it appears that when an organization's availability in computer-based technology increases, so to does the availability of its organizational development strategies. The first hypothesis is supported for the availability of product-oriented technology and its relationship to process-oriented, organizational development strategies

Table 4.3a Correlations Between the Availability of Computer-based Technology and Organizational Development Strategies

	Hardware Available	Software Available	Organizational Development Available
Hardware	1.00		
Software	.53**	1.00	
Organizational Development	.55**	.42**	1.00

** P < .05
N = 110 overall

Hypothesis 2:

The availability of computer-based technology will be a statistically significant correlation with product-oriented technological change processes.

Table 4.3b begins to delve deeper into the product-oriented and process-oriented technological change and decision-making processes. Since our hypothesis was concerned with whether computer-based technology correlated with product-oriented technological change (i.e., whether staff participates in the decision-making for computer-based technology), it was necessary to dichotomize technology into products (i.e., computer-based hardware and software) and processes (i.e., organizational development strategies) in order to differentiate between types of technology. Thus, it appears that there is a statistically significant relationship between computer-based hardware and product-oriented technological change and decision-making processes, thereby supporting hypothesis 2. In effect, there is a slight correlation, a .25, that is statistically significant at an alpha .05

level. However, if squared, Pearson's R^2 only explains 6% of the variance between these two variables, indicating that as computer-based technology increases so to does staff decision-making in product-oriented technological change.

In further examination of the correlational table, note that organizational development is also correlated positively. The correlations for organizational development strategies available, reflecting an $r = .39$, $p < .05$, are correlated significantly more positively with both the combined product-oriented and process-oriented technological and decision-making processes as well as with product-oriented changes itself.

Table 4.3b Correlations Between the Availability of Computer-based and Organizational Development Strategies and Overall Technological Change and Decision-making Processes

Overall Technological Change and Decision-Making Process (Staff Participation in DM)	Hardware Available	Software Available	Organizational Development Available
Product-oriented and Process-oriented TC/DM Processes	.20*	.35**	.39**
Product-oriented TC/DM	.25**	.33**	.32**
Process-oriented TC/DM	.13	.34**	.44**

* P < .10
** P < .05
TCP = Technological Change Process (also used synonymously with Product-oriented)
DM = Decision-making Process (also used synonymously with Process-oriented)
N = 110 overall

Hypothesis 3:

> **Statistically significant differences will exist between computer-based technology and organizational development strategies as they are correlated with specific technological change processes.**

Table 4.3c provides a more detailed differentiation between the technological change process. The process is dichotomized between product-oriented and process-oriented technological change. That is, it appears that as the availability of computer-based hardware increases in the organizations, the amount of staff participation in technological change decision-making also increases. Specifically, hardware is positively and significantly correlated with product-oriented innovation, adoption, implementation, and transference. With respect to organizational development strategies available, all levels of the technological change process are statistically significant. Thus, it appears that as organizational development strategies also become more available in the organization so to does the amount of decision-making by staff in the organization's technological change process. Overall, these findings would confirm hypothesis 3 that there are differences between the availability of either computer-based hardware and organizational development strategies and their relationship to specific technological change processes.

Table 4.3c Correlations Between the Availability of Computer-based Technology and Organizational Development Strategies and Specific Technological Change Processes

Technological Change Process Staff Participation in Decision-Making (Both CT and OD)	**Computer Hardware**	**Organizational Development**
Innovation (CT/OD)	.18	.36**
Product-oriented (CT)	.24**	.29**
Process-oriented (OD)	.11	.41**
Adoption (CT/OD)	.16	.41**
Product-oriented (CT)	.20*	.35**
Process-oriented (OD)	.10	.44**
Implementation (CT/OD)	.21**	.40**
Product-oriented (CT)	.25**	.30**
Process-oriented (OD)	.14	.46**
Transference (CT/OD)	.21**	.38**
Product-oriented (CT)	.25**	.33**
Process-oriented (OD)	.14	.41**

* $P < .10$
** $P < .05$
CT = Computer-based Technology (Level of decision-making by staff)
OD = Organizational Development (Level of decision-making by staff)
N = 110 overall

Note: Software was eliminated from this comparison. However, although no statistically significant coefficients are shown under organizational development, there still appears to exist a relationship whereby all process-oriented coefficients under OD are greater than their product-oriented counterparts.

Hypothesis 4:

> **Computer-based hardware will correlate significantly with product-oriented decision-making while organizational development will correlate significantly with process-oriented decision-making.**

Thus far, our discussions on the availability of technology and its relationship to the overall technological change process has been more general. Now, as we narrow our perspective to more closely examine the decision-making process phases, we see in Table 4.3d that hardware available is significantly correlated with each of the main decision-making process phases. The highest hardware correlations are within each of the product-oriented phases. For example, the monitoring phase of product-oriented decision-making has the highest correlation of .33 while product-oriented conceptualization has an $r = .28$, both significant at a .05 alpha level. In addition, organizational development strategies available are also significantly correlated with each of the decision-making phases. As shown in Table 4.3d, all of the decision-making processes, both product-oriented and process-oriented, are significantly correlated with the availability of organizational development strategies. Thus, there appears to be support for hypothesis 4.

In sum, the last correlational hypothesis in this section is under hypothesis 5. The availability and use of either computer-based hardware and organizational development strategies are examined in terms of their relationship to race, gender, and age of the organization.

Table 4.3d Correlations Between the Availability of Computer-based Technology and Organizational Development Strategies and Specific Decision-making Processes

Decision-Making Process Phases Staff Participation (Both CT and OD)	Computer Hardware	Organizational Development
Conceptualization (CT/OD)	.24	.40**
Product-oriented (CT)	.28*	.36**
Process-oriented (OD)	.17	.40**
Design (CT/OD)	.19*	.36**
Product-oriented (CT)	.25**	.30**
Process-oriented (OD)	.10	.40**
Implementation (CT/OD)	.18*	.41**
Product-oriented (CT)	.20**	.34**
Process-oriented (OD)	.13	.45**
Monitor (CT/OD)	.31**	.40**
Product-oriented (CT)	.33**	.34**
Process-oriented (OD)	.27**	.44**
Evaluation (CT/OD)	.20**	.36**
Product-oriented (CT)	.25**	.30**
Process-oriented (OD)	.13	.40**

* $P < .10$
** $P < .05$
$N = 110$ overall

Hypothesis 5:

> **Racial and gender differences will show statistically significant correlations with both computer-based technology and organizational development strategies.**

Table 4.3e indicates that the availability and use of hardware and organization development strategies correlate significantly with minority recipients. Specifically, Table 4.3e shows that as the number of hardware components and organizational development strategies increases, as well as their use, so too does the number of minority recipients. Regrettably, however, we cannot provide a cause and effect answer for this correlation. It does leave one to ask whether this increase in technology and organizational development strategies makes the organizations more efficient thereby enabling them to increase their services to their recipients. Or, conversely, as the number of recipients needing services increases, does this then require the organizations to increase their amount of technology and organizational development just in order to keep up with the demand for services.

What is also shown in the findings is the fact that there is an inverse relationship between number of minority and female employees and the availability and uses of technology and organizational development strategies. Note, however, that for minority employees, the only significant finding is their amount of hardware technology available, which is a small negative correlation significant at alpha .10 level. Whereas for females employees, the findings are all significant and, as mentioned, are negatively correlated. Therefore, based on these findings, it appears that hypothesis 5 is also supported.

Table 4.3e Correlation Between the Availability and Use of Computer-based Technology and Organizational Development and Total Percent Minority Recipients, Minority and Female Employees, and Age of Organization

	Computer-based Hardware		Organizational Development	
Race/Gender/Age of Organization	**Available**	**Used**	**Available**	**Used**
Minority recipients	.21**	.29**	.27**	.22**
Female recipients	.07	.15*	.13	.19**
Minority employees	-.18*	-.11	-.02	-.01
Female employees	-.14*	-.18**	-.18*	-.16*
Age of organization	.07	.24**	.13	.09

* P < .10
** P < .05

One-Way Analysis of Variance (ANOVA) Hypotheses

Hypothesis 6:

> **Organizations who have available desktop computers will report significant differences in staff participation in overall product-oriented technological changes and decision-making processes than organizations who do not have desktop computers.**

Hypothesis 6 indicates that organizations who have available desktop computers will report significant differences in staff participation in overall process-oriented technological change than organizations that do not have available desktop computers. Thus, one-way analysis of variance was used to determine if significant differences existed with respect to the product-oriented technological change processes for those two groups (i.e., desktop computers available and not available). The results are presented in Table 4.3f.

As reflected in Table 4.3f, there exist statistically significant differences between organizations who have available desktop computers versus those who do not have these computers available. With respect to each of the product-oriented technological change processes, all turned out statistically significant. The greatest difference appears to exist at the implementation stage ($F = 6.23$, $p < .05$). Thus, it appears that participation in technological change is more prevalent in organizations that have available desktop computers. Hypothesis 6 is thereby supported given the nature of these findings.

Table 4.3g, on the other hand, examines the relationship between organizations who have available computer-based technology versus those who do not and compare these different groups to process-oriented technological change. The findings from Table

4.3g, though not part of hypothesis 6, show no significant difference between groups and their relationship to process-oriented technological change.

Table 4.3f One-way Analysis of Variance of Computer-based Technology (Product-Oriented) Available Versus Not Available by Product-Oriented Technological Change Process

Product-oriented (Computer-based) Technological Change Process (Staff participation in Decision-Making)	N	Mean	S.D.	F-Ratio
Innovation (CT)				
Available	77	3.54	1.07	3.56*
Not available	7	2.71	1.45	
Adoption (CT)				
Available	76	3.38	1.02	2.96*
Not available	7	2.65	1.46	
Implementation (CT)				
Available	77	3.62	1.02	6.23**
Not available	7	2.57	1.55	
Transference (CT)				
Available	75	3.32	1.11	3.00*
Not available	7	2.54	1.49	

*P < .10
**P < .05
N = 110 overall

Table 4.3g **One-way Analysis of Variance of Computer-based Technology (Product-Oriented) Available Versus Not Available by Process-Oriented Technological Change Process**

Process-Oriented (Org. Devel.) Technological Change Process (Staff Participation in Decision-Making)	N	Mean	S.D.	F-Ratio
Innovation (OD)				
Available	77	3.49	.91	1.49
Not available	8	3.05	1.48	
Adoption (OD)				
Available	77	3.38	.94	1.11
Not available	7	2.97	1.53	
Implementation (OD)				
Available	77	3.39	.94	1.00
Not available	7	3.00	1.53	
Transference (OD)				
Available	77	3.33	.96	.82
Not available	7	2.97	1.56	

N = 110 overall

Tables 4.3f and 4.3g provide answers to the product-oriented and process-oriented technological change process and are not intended to address the decision-making processes. Whereas, Tables 4.3h and 4.3i, on the other hand, indicate that computer-based technology available in organizations versus those where it is not available, are statistically more likely to participate in staff decision-making about product-oriented technological change. However, with respect to the design phase, that is not the case. It appears that even with so few cases, that organizations which do not have available a desktop computer are more likely to participate in the design phases of product-oriented technological change decision-making. Table 4.3i is centered around process-oriented decision-making and indicates that there are statistically significant differences between these two groups within two processes. However, the level of staff participation in process-oriented technological change in decision-making is far greater in the conceptualization phases as opposed to the others. Again, collectively each of these tables appears to support hypothesis 6.

Table 4.3h One-way Analysis of Variance of Computer-based Technology (Product-oriented) Available Versus Not Available by Product-Oriented Decision-Making Process

Product-oriented (Computer-based) Decision-making Process (Staff Participation in Decision-Making)	**N**	**Mean**	**S.D.**	**F-Ratio**
Conceptualization (CT)				
Available	82	3.49	1.06	8.34**
Not available	10	2.42	1.41	
Design (CT)				
Available	78	3.47	1.49	8.25**
Not available	9	2.27	1.14	
Implementation (CT)				
Available	79	3.56	1.07	6.18**
Not available	8	2.53	1.52	
Monitor (CT)				
Available	80	3.35	1.10	7.61**
Not available	8	2.18	1.46	
Evaluate (CT)				
Available	77	3.50	1.05	4.50**
Not available	7	2.57	1.61	

**P < .05
N = 110 overall

Table 4.3i **One-way Analysis of Variance of Computer-based Technology (Product-oriented) Available Versus Not Available by Process-Oriented Decision-Making Process**

Process-oriented (Org. Devel.) Decision-making Process (Staff Participation in Decision-Making)	N	Mean	S.D.	F-Ratio
Conceptualization (OD)				
Available	83	3.50	.96	5.37**
Not available	10	2.70	1.55	
Design (OD)				
Available	80	3.39	1.47	2.96*
Not available	9	2.75	1.01	
Implementation (OD)				
Available	78	3.43	1.69	2.09
Not available	8	2.87	.95	
Monitor (OD)				
Available	79	3.26	1.35	2.45
Not available	9	2.66	1.04	
Evaluate (OD)				
Available	76	3.36	1.05	.84
Not available	7	2.96	1.50	

*P < .10
**P < .05
N = 110 overall

Hypothesis 7:

> **Organizations who have available strategic planning will report significant differences in staff participation in overall product-oriented technological changes and decision-making processes than organizations who do not have strategic planning.**

The last four tables examine one aspect of organizational development, specifically, strategic planning. Hypothesis 7 indicates that significant differences will be found between organizations which have available and practice strategic planning versus organizations which do not. Tables 4.3j, 4.3k, 4.3l, and 4.4m all examine different aspects of the technological change and decision-making process. For example, Table 4.3j focuses on staff participation in product-oriented (CT) decision-making for technological change while Table 4.3k addresses process-oriented (OD) decision-making for technological change. The findings from both tables indicate that there are statistically significant differences in staff participation in decision-making between organizations which have available strategic planning versus those which do not.

Table 4.3j, for example, indicates that there exist statistically significant differences between the groups and the greatest difference lies in the area of transference, with respect to their means and F-ratio. Whereas for Table 4.3k the greatest difference lies in the areas of implementation where the mean difference is .72 and the F-ratio is 9.02, $p < .05$. With respect to Tables 4.3l and 4.3m, both tables also reveal statistically significant differences between the group at each decision-making phase. Tables 4.3l and 4.3m indicate that the design phase is where the greatest difference exists between groups

Therefore, our overall observation of these findings leads us to conclude that hypothesis 7 should be accepted.

Table 4.3j One-way Analysis of Variance of Organizational Development Strategies (Process-oriented) Available Versus Not Available by Product-Oriented Technological Change Process

Product-oriented (CT) Technological Change Process (Staff Participation in Decision-Making)	**N**	**Mean**	**S.D.**	**F-Ratio**
Innovation (CT)				
Available	61	3.58	1.01	4.08**
Not available	20	3.01	1.34	
Adoption (CT)				
Available	60	3.47	.96	8.45**
Not available	20	2.71	1.17	
Implementation (CT)				
Available	61	3.67	.95	6.32**
Not available	20	2.99	1.35	
Transference (CT)				
Available	59	3.43	1.04	8.87**
Not available	20	2.59	1.23	

**P < .05
N = 110 overall

Table 4.3k One-way Analysis of Variance of Organizational Development Strategies (Process-oriented) Available Versus Not Available by Process-Oriented Technological Change Process

Process-oriented (OD) Technological Change Process (Staff Participation in Decision-Making)	N	Mean	S.D.	F-Ratio
Innovation (OD)				
Available	61	3.55	.84	4.83**
Not available	21	3.02	1.20	
Adoption (OD)				
Available	61	3.46	.86	5.82**
Not available	20	2.87	1.20	
Implementation (OD)				
Available	61	3.50	.86	9.02**
Not available	20	2.78	1.12	
Transference (OD)				
Available	61	3.42	.90	6.44*
Not available	20	2.79	1.16	

**P < .05
N = 110 overall

Table 4.31 **One-way Analysis of Variance of Organizational Development Strategies (Process-oriented) Available Versus Not Available by Product-Oriented Decision-Making Process**

Product-oriented (CT) Decision-making Process (Staff Participation in Decision-Making)	N	Mean	S.D.	F-Ratio
Conceptualization (CT)				
Available	66	3.57	.98	8.85**
Not available	22	2.78	1.31	
Design (CT)				
Available	62	3.56	1.08	10.89**
Not available	22	2.61	1.33	
Implementation (CT)				
Available	63	3.61	1.02	6.40**
Not available	21	2.90	1.33	
Monitor (CT)				
Available	64	3.42	1.06	10.23**
Not available	21	2.53	1.24	
Evaluate (CT)				
Available	61	3.56	1.00	6.53**
Not available	20	2.85	1.31	

**P < .05
N = 110 overall

Table 4.3m One-way Analysis of Variance of Organizational Development Strategies (Process-oriented) Available Versus Not Available by Process-Oriented Decision-Making Process

Process-oriented (OD) Decision-making Process (Staff Participation in Decision-Making)	N	Mean	S.D.	F-Ratio
Conceptualization (OD)				
Available	67	3.55	.89	5.60**
Not available	22	2.97	1.28	
Design (OD)				
Available	63	3.49	.94	8.98**
Not available	23	2.75	1.18	
Implementation (OD)				
Available	62	3.52	.93	8.28**
Not available	21	2.80	1.15	
Monitor (OD)				
Available	63	3.35	.97	8.82**
Not available	22	2.60	1.16	
Evaluate (OD)				
Available	60	3.40	1.00	5.53**
Not available	20	2.81	1.18	

**P < .05
N = 110 overall

Research Cluster 2: The Technological Change Process: Innovation, Adoption, Implementation, Transference.

We begin by asking ourselves whether a relationship exists between the technological change process and its corresponding decision-making process. More specifically, research question two examines the overall technological change process more closely. For example, the correlational analysis section focuses on two aspects of the technological change process. First is the relationship between the technological change process and the decision-making process. Second is how support for computer-based technological change and organizational development change affects the technological change process.

Correlational Hypotheses

Hypothesis 8:

> **The overall relationships between the technological change and decision-making processes will be statistically significant.**

Table 4.4a provides a detailed breakdown of both the technological change and decision-making process. As mentioned previously, the technological change process consists of innovation, adoption, implementation, and transference, each with both a product-oriented (i.e., hard) and process-oriented (i.e., soft) attribute endemic to their structure. Conversely, the decision-making process consists of conceptualizing, designing, implementing, monitoring, and evaluating a product-oriented or process-oriented

Table 4.4a

Correlation between Product-Oriented and Process-Oriented Technological Change and Decision-Making Processes

	TECHNOLOGICAL CHANGE PROCESS (TCP)												
Decision-making process (DMP)	Innovate Hard	Innovate Soft	Innovate Total	Adopt Hard	Adopt Soft	Adopt Total	Implement Hard	Implement Soft	Implement Total	Transfer Hard	Transfer Soft	Transfer Total	Total DMP (Hard & Soft)
Conceptualize													
Hard	.93*	.82*	.92*	.92*	.81*	.90*	.91*	.81*	.90*	.92*	.84*	.91*	
Soft	.75*	.92*	.86*	.78*	.93*	.88*	.72*	.92*	.85*	.75*	.91*	.86*	---.81*---
Total	.90*	.92*	.94*	.90*	.92*	.94*	.86*	.91*	.93*	.89*	.92*	.94*	
Design													
Hard	.94*	.78*	.90*	.95*	.78*	.90*	.95*	.79*	.92*	.96*	.82*	.91*	
Soft	.78*	.92*	.88*	.92*	.95*	.92*	.75*	.93*	.88*	.80*	.93*	.88*	--- .80*---
Total	.92*	.89*	.94*	.94*	.91*	.96*	.90*	.91*	.95*	.93*	.92*	.95*	
Implement													
Hard	.93*	.83*	.92*	.93*	.83*	.92*	.94*	.82*	.93*	.93*	.83*	.91*	
Soft	.72*	.90*	.83*	.78*	.92*	.88*	.70*	.93*	.85*	.76*	.91*	.85*	--- .82*---
Total	.87*	.91*	.92*	.90*	.92*	.95*	.87*	.92*	.94*	.89*	.92*	.93*	
Monitor													
Hard	.90*	.81*	.89*	.92*	.78*	.88*	.91*	.81*	.90*	.88*	.79*	.87*	
Soft	.83*	.89*	.89*	.82*	.85*	.87*	.78*	.87*	.87*	.82*	.88*	.85*	--- .90*---
Total	.89*	.87*	.91*	.90*	.84*	.90*	.87*	.86*	.91*	.88*	.86*	.88*	
Evaluate													
Hard	.94*	.82*	.92*	.94*	.80*	.90*	.95*	.81*	.93*	.93*	.82*	.90*	
Soft	.86*	.93*	.93*	.88*	.92*	.93*	.83*	.92*	.92*	.87*	.93*	.91*	--- .89*---
Total	.92*	.90*	.95*	.94*	.88*	.94*	.92*	.89*	.95*	.93*	.90*	.93*	
Total TCP (Hard/Soft)	--- .85*---			---.86*---			---.81*---			---.87*---			--- .87*---

technological change. Thus, Table 4.4a reveals that all relationships are statistically significant. In more general terms, the highest overall relationships within the technological change process are the adoption and transference processes, consisting of an $r = .86$, $p < .05$, and $r = .87$, $p < .05$, respectively.

With respect to the decision-making processes, the two highest correlations are in monitoring and evaluating. Note, however, that this simply means that as staff participation increases in one, such as technological change overall, it also increases in the overall decision-making process as well. When examining the individual cells more thoroughly, it becomes quite apparent that the correlations between hard and soft are consistently small. However, apart from what has been discussed thus far, it appears that hypothesis 8 is supported.

Hypothesis 9:

> **Support for computer-based technological change will be correlated more significantly with the overall technological change process than support for organizational development change.**

Table 4.4b indicates that all of the support variables are correlated significantly with the technological change and decision-making variables. All of the correlations between support for computer-based technology and the product-oriented technological change process are positively correlated and they exceed the correlations between support for organizational development and the product-oriented variables. However, when support for organizational development is correlated with process-oriented technological change, their correlations then exceed their computer-based counterpart. Thus, it appears that hypothesis 9 is supported. A unique observation however is the fact that support for organizational development is more positively correlated with process-oriented technological change. In effect, this indicates that as organizational development strategies are introduced into an organization that more process-oriented decision-making increases by staff.

While designing this research study and developing the hypotheses, we were concerned with whether support for computer-based technology and organizational development could effectively be distinguished and be viewed as separate in their own population for comparison purposes. Thus, a t-test was used to assist in determining whether support for computer-based technological change differed from support for organizational development change. The results from Table 4.4c clearly show that the measure used to distinguish these two groups are statistically significant, at an alpha $p < .05$, and that their does exist a distinct difference in populations.

Table 4.4b** **Correlations Between Types of Support of Computer-based Technological and Organizational Development Strategy Change and the Technological Change Process**

	SUPPORTS CHANGE**		
TCP/DM Process	**Overall**	**Computer-based**	**Organizational Development**
Product-oriented and Process-oriented TC/DM Processes	.52	.49	.40
Product-oriented TC/DM	.49	.52	.30
Process-oriented TC/DM	.52	.42	.48
Innovation	.51	.47	.40
Product-oriented	.48	.51	.31
Process-oriented	.50	.38	.47
Adoption	.51	.46	.41
Product-oriented	.45	.46	.30
Process-oriented	.53	.42	.48
Implementation	.50	.47	.37
Product-oriented	.45	.50	.26
Process-oriented	.50	.40	.46
Transference	.49	.47	.36
Product-oriented	.47	.50	.29
Process-oriented	.49	.40	.43

** $P < .05$ All relationships are statistical significance.
N = 110 overall

Table 4.4c T-test for Paired Differences Between Support for Computer-based and Organizational Development Technological Change

	Mean	S.D.	Correlation	PAIRED DIFFERENCES T-value	dF	2-tail
Supports computer-based technological change	3.18	.85	--	--	--	--
			.46	3.66	95	.000**
Supports organizational development strategy changes	2.86	.81				

** P < .05

One-Way Analysis of Variance (ANOVA) Hypotheses

Hypothesis 10:

There are differences within and between the overall technological change and decision-making processes combined on the level of support for computer-based technological and organizational development change.

Hypothesis 10 indicates that there are differences between levels of support for technological and organizational development change. Thus, support was organized into four categories: 1) Not supportive, 2) Somewhat supportive, 3) Supportive, and 4) Very supportive. These levels of support were divided into two major categories. The first focuses on how supportive the overall organization is on computer-based technological change while the second focuses on how supportive is the overall organization on changes in organizational development strategies. To assist in making comparisons between means among levels of support for change, Scheffe' contrasts were run on those items showing a significant difference among the four groups of support. Scheffe' post hoc multiple comparison test is the most conservative for pairwise comparisons of means and requires larger differences between means for significance. Therefore, because we only utilized these two measures of support, it was deemed that we should err on the side of a rather conservative interpretation.

The initial set of findings for hypothesis 10 indicates that there are overall significant differences between levels of support. That is, Table 4.4d clearly shows there exist a high level of support for product-oriented change with respect to staff participation in decision-making. Moreover, organizational development change and level of support are also significant, except for the fact that most respondents were simply supportive. Therefore, hypothesis 10 is also supported based on these findings.

Table 4.4d One-way Analysis of Variance of Overall Product-Oriented and Process-Oriented Technological Change and Decision-making Processes (TC/DMP) by Level and Type of Support

TC/DM by Level of TC & OD Support	N	Mean	S.D.	F-Ratio
Level of Support for Product-Oriented TC				
Not supportive	4	2.55	1.84	
Somewhat supportive	8	2.52	.86	9.38**
Supportive	34	3.10	.93	
Very Supportive	34	3.95	.69	
Level of Support for Process-Oriented OD				
Not supportive	3	3.20	1.89	
Somewhat supportive	20	2.67	1.02	6.52**
Supportive	40	3.48	.83	
Very Supportive	17	3.99	.85	

** $P < .05$

Hypothesis 11:

There are differences within and between the overall product-oriented and process-oriented technological change and decision-making processes on the level of support for computer-based technological and organizational development change.

Table 4.4e provides a comprehensive overview of the technological change and decision-making process as they relate to the level and type of support for change. Each level of support indicates statistical significance. Within the first four groups, the group identified as "Very Supportive" has the highest mean. Scheffe' comparison analysis also reveals genuine differences between the groups. That is, it appears that the "Very Supportive" group is most likely to support staff participation in the decision-making for technological change. Moreover, the second cluster indicates that they, too, are more supportive then the nonsupportive groups.

The third and fourth cluster centers around level of support for organizational development. The third grouping indicates that the mean for "Not Supportive" is not significantly correlated with any other group. Overall, however, Table 4.4e confirms hypothesis 11. As previously mentioned, when examining overall F-ratios, it appears to be quite consistent that organizations in support of product-based technological change are more apt to support staff participation in technological change. The same applies for pure organizational development. What differs is the fact that relationships that are mixed (i.e., product-based technological change with organizational development decision-making) are not as supportive of either technological or organizational change, nor are they in terms of increasing staff participation in the decision-making process.

Table 4.4e One-way Analysis of Variance of Support for TC/OD by Product-Oriented and Process-Oriented TC/DM

TC/DM by Level of CT & OD Support	N	Mean	S.D.	F-Ratio
1) TC/DM Product-oriented by Level of Support for TC				
Not supportive	4	2.15	1.92	
Somewhat supportive	8	2.55	.86	10.46**
Supportive	34	3.12	.98	
Very supportive	34	4.04	.79	
2) TC/DM Process-oriented by Level of Support for TC				
Not supportive	4	2.95	1.99	
Somewhat supportive	8	2.49	.87	7.44**
Supportive	35	3.08	.91	
Very supportive	34	3.86	.71	
3) TC/DM Product-oriented by Level of Support for OD				
Not supportive	3	3.51	1.77	
Somewhat supportive	20	2.73	1.16	4.16**
Supportive	40	3.52	.94	
Very supportive	17	3.89	1.03	
4) TC/DM Process-oriented by Level of Support for OD				
Not supportive	3	2.90	1.93	
Somewhat supportive	20	2.62	.93	9.09**
Supportive	41	3.42	.79	
Very supportive	17	4.09	.8	

** P < .05
N = 110 overall

Hypothesis 12:

> **There are statistically significant differences within and between specific product-oriented and process-oriented technological change processes on level of support for computer-based technological change.**

Hypothesis 12 was concerned with the product and process side of the technological change process. Since staff participation in decision-making may depend on how the organization perceives changes either technologically and/or organizationally, it was determined that this collapsing of the technological change process would provide a more thorough picture for analysis. First and foremost, Table 4.4f appears to indicate that all relationships are statistically significant at a .05 alpha level. Unlike the Scheffe' post hoc multiple comparison's test, the following one-way ANOVAs are using the least-significance differences (LSD) test. It was subsequently determined that in order to identify subtle relationships between and within groups, the LSD test would be the most appropriate.

Thus, the four groups within the product-oriented (computer-based) innovation component are all statistically significant. That is, at the product innovation stage, staff participation in decision-making is greatest when the organization is either "supportive" or "very supportive" in the product-oriented technological change. However, when examining the results more closely, it appears that the LSD test, though very liberal in interrelational measurement, reveals that staff have little decision-making in process-oriented (OD) change when the organization is more supportive of product-oriented technological change (TC). Therefore, it appears that hypothesis 12 is supported as well.

Table 4.4f One-way Analysis of Variance of Level of Computer-based Technology Support for Product-oriented and Process-oriented Technological Change

TC by Level of CT Support	N	Mean	S.D.	F-Ratio
Innovation (Product-oriented)				
Level of Support for CT				
Not supportive	4	2.30	1.88	
Somewhat supportive	9	2.71	.91	11.11**
Supportive	36	3.13	.99	
Very supportive	35	4.15	.82	
Innovation (Process-oriented)				
Level of Support for CT				
Not supportive	4	3.20	1.91	
Somewhat supportive	10	2.76	.93	6.75**
Supportive	36	3.18	.92	
Very supportive	35	3.94	.68	
Adoption (Product-oriented)				
Level of Support for CT				
Not supportive	4	2.25	1.89	
Somewhat supportive	8	2.45	.88	7.71**
Supportive	35	3.11	.96	
Very supportive	36	3.83	.85	
Adoption (Process-oriented)				
Level of Support or CT				
Not supportive	4	2.85	2.04	
Somewhat supportive	8	2.42	.88	7.41**
Supportive	36	3.13	.89	
Very supportive	36	3.83	.73	
Implementation (Product-oriented)				
Level of Support for CT				
Not supportive	4	2.05	1.96	
Somewhat supportive	8	2.67	.91	9.07**
Supportive	36	3.37	.98	
Very supportive	36	4.06	.82	
Implementation (Process-oriented)				
Level of Support for CT				
Not supportive	4	2.85	2.04	
Somewhat supportive	8	2.47	.86	6.24**
Supportive	36	3.17	.93	
Very supportive	36	3.80	.72	

Table 4.4f (cont'd)

TC by Level of CT Support	**N**	**Mean**	**S.D.**	**F-Ratio**
Transference (Product-oriented)				
Level of Support for CT				
Not supportive	4	2.15	1.92	
Somewhat supportive	9	2.53	.79	10.26**
Supportive	35	2.89	1.10	
Very supportive	34	3.95	.79	
Transference (Process-oriented)				
Level of Support for CT				
Not supportive	4	2.90	2.09	
Somewhat supportive	9	2.53	.86	6.88**
Supportive	35	3.03	.94	
Very supportive	36	3.81	.75	

** P < .05
N = 110 overall

Hypothesis 13:

> **There are differences within and between specific product-oriented and process-oriented technological change processes on level of support for organizational development change.**

Hypothesis 13 is the last relationship to be examined in the technological change section. Specifically, hypothesis 13 virtually mirrors hypothesis 12, except for the fact that hypothesis 13 is focused on support for organizational development strategy changes. Table 4.4j indicates that the various groups within the organization are more supportive toward organizational development change when staff participates in product-based technological decision-making. The mean differences between product and process technological changes (i.e., innovation to transference) are all greater when staff is participating in product-oriented technological changes decisions. This, again, appears to indicate that the organizations are more supportive of change if it is product-based and where staff participation in decision-making is product driven. Thus, the overall findings support hypothesis 13.

Table 4.4g One-way Analysis of Variance of Level of Organizational Development Support for Product-oriented and Process-oriented Technological Change

TC by Level of OD Support	N	Mean	S.D.	F-Ratio
Innovation (Product-oriented)				
Level of Support for OD				
Not supportive	3	3.60	1.63	
Somewhat supportive	21	2.78	1.15	4.50**
Supportive	42	3.59	.99	
Very supportive	18	3.97	1.04	
Innovation (Process-oriented)				
Level of Support for OD				
Not supportive	3	3.00	1.90	
Somewhat supportive	22	2.78	.93	9.15**
Supportive	42	3.51	.77	
Very supportive	18	4.18	.75	
Adoption (Product-oriented)				
Level of Support for OD				
Not supportive	3	3.33	1.94	
Somewhat supportive	20	2.67	1.15	4.06**
Supportive	42	3.43	.88	
Very supportive	18	3.77	1.01	
Adoption (Process-oriented)				
Level of Support or OD				
Not supportive	3	2.93	1.92	
Somewhat supportive	20	2.61	.91	9.76**
Supportive	43	3.40	.79	
Very supportive	18	4.12	.79	
Implementation (Product-oriented)				
Level of Support for OD				
Not supportive	3	3.80	1.90	
Somewhat supportive	20	2.87	1.19	3.81**
Supportive	43	3.66	.91	
Very supportive	18	3.93	1.05	
Implementation (Process-oriented)				
Level of Support for OD				
Not supportive	3	2.86	1.94	
Somewhat supportive	20	2.64	.98	8.27**
Supportive	43	3.45	81	
Very supportive	18	4.03	.74	

Table 4.4g (cont'd)

TC by Level of OD Support	N	Mean	S.D.	F-Ratio
Transference (Product-oriented)				
Level of Support for OD				
Not supportive	3	3.33	1.70	
Somewhat supportive	21	2.64	1.18	3.56**
Supportive	41	3.34	1.05	
Very supportive	17	3.80	1.04	
Transference (Process-oriented)				
Level of Support for OD				
Not supportive	3	2.86	1.94	
Somewhat supportive	21	2.60	.95	7.38**
Supportive	42	3.40	.84	
Very supportive	18	3.95	.87	

** $P < .05$

N = 110 overall

Research Cluster 3: The Decision-Making Process: Conceptualization, Design, Implementation, Monitor, Evaluation.

The third major research question to address is whether a relationship exists between the decision-making process and the organization's support for technological and/or organizational development change. The preceding section focuses solely on the technological change process, ranging from innovation to transference. However, this section delves deeper into the decision-making process at both a product-oriented and process-oriented level. The two major statistics used for this analysis are correlations and one-way ANOVA.

Correlational Hypotheses

Hypothesis 14:

> **Support for computer-based technological change will be correlated more significantly with specific product-oriented decision-making processes than support for organizational development change.**

The correlations between support for technology, both computer-based and organizationally-based, and the decision-making process components are presented in Table 4.4h. Support for computer-based technology was significantly positively correlated with each of the product-oriented decision-making processes. Specifically, the product-oriented conceptualization phase ($r = .49$, $p < .05$), design phase ($r = .46$, $p < .05$), implementation phase ($r = .47$, $p < .05$), monitor phase ($r = .42$, $p < .05$), and evaluation phase ($r = .52$, $p < .05$), all represent moderately high correlations. Moreover, it also appears that all the computer-based correlations with their corresponding product-oriented decision-making phases were all of a higher correlation than their support for organizational development change counterpart. However, what is unique is the fact that support for organizational development change and its relationship to process-oriented decision-making components surpass the computer-based support variable.

Therefore, these analyses suggest that support for computer-based technological change by the organization is related to staff participation in the technological change decision-making process. Conversely, the relationships between organizational development and process-oriented decision-making are also statistically related. In effect, both of these relationships not only support hypothesis 14 but enable us to build on other theoretical relationships.

Table 4.4h** **Correlations Between Types of Support of Computer-based Technological and Organizational Development Strategy Change and the Decision-making Process**

	SUPPORTS CHANGE**		
Decision-making Process	**Overall**	**Computer-based**	**Organizational Development**
Conceptualization	.52	.47	.44
Product-oriented	.49	.49	.36
Process-oriented	.50	.39	.47
Design	.46	.43	.34
Product-oriented	.41	.46	.22
Process-oriented	.46	.36	.42
Implementation	.48	.44	.38
Product-oriented	.44	.47	.28
Process-oriented	.46	.35	.44
Monitor	.45	.40	.35
Product-oriented	.41	.42	.27
Process-oriented	.45	.35	.41
Evaluation	.52	.50	.37
Product-oriented	.47	.52	.26
Process-oriented	.52	.43	.44

** $P < .05$ All relationships are statistical significance.
N = 110 overall

One-Way Analysis of Variance (ANOVA) Hypotheses

Hypothesis 15:

There are differences within and between product-oriented decision-making processes on the level of support for computer-based technological change.

The analyses which follow are products of a one-way ANOVA statistic. That is, since our interest earlier was on the technological change process and support by the organization, we have now chosen to narrow our focus. The approach used for analyzing the technological change process is simply being reapplied in this analysis, except for the fact that the model components are different. Our intention is to still focus on support for technological or organizational development change but to examine the decision-making processes more closely, especially its distinct technologies, i.e., products and process, as mentioned.

Tables 4.4i and 4.4j are an integration of both the product and process qualities of technology. The product-oriented technologies are based on the level of staff decision-making in the technological decision-making process, not unlike the technological change processes previously mentioned. This same situation applies to process-oriented qualities as well. Thus far, it appears that all the relationships are statistically significant. As indicated through the use of LSD, each of the four groupings of support for computer-based technological change shown in Table 4.4j reflects the fact that as support for technological change increases so to does the amount of staff participation in the technological decision-making process. However, unlike the technological change process, the distinction between staff's role in decision-making for either products or process changes is somewhat more attenuated and less distinct. With the exception of the conceptualization phase in Table 4.4i, the other F-ratios and their mean differences are not so drastically different. Table 4.4j, on the other hand, appears to support the thesis that as support by the organization increases for organizational development strategies changes, so to does the amount of staff participation in the technological decision-making process.

Table 4.4i **One-way Analysis of Variance of Level of Computer-based Technological Support for Product-oriented and Process-oriented Decision-Making (DM)**

DM by Level of CT Support	N	Mean	S.D.	F-Ratio
Conceptualization (Product-oriented)				
Level of Support for CT				
Not supportive	5	2.20	1.78	
Somewhat supportive	11	2.77	.79	10.21**
Supportive	36	3.09	1.00	
Very supportive	39	4.01	.88	
Conceptualization (Process-oriented)				
Level of Support for CT				
Not supportive	5	2.70	2.01	
Somewhat supportive	11	2.77	.86	5.94**
Supportive	37	3.25	.98	
Very supportive	39	3.89	.80	
Design (Product-oriented)				
Level of Support for CT				
Not supportive	4	2.00	2.00	
Somewhat supportive	9	2.41	.81	7.59**
Supportive	35	3.21	1.13	
Very supportive	38	3.89	.98	
Design (Process-oriented)				
Level of Support or CT				
Not supportive	4	2.87	1.93	
Somewhat supportive	9	2.52	.80	5.04**
Supportive	37	3.18	1.05	
Very supportive	38	3.76	.82	
Implementation (Product-oriented)				
Level of Support for CT				
Not supportive	4	2.25	1.89	
Somewhat supportive	9	2.77	1.02	8.15**
Supportive	37	3.25	1.09	
Very supportive	36	4.06	.75	
Implementation (Process-oriented)				
Level of Support for CT				
Not supportive	4	3.18	1.99	
Somewhat supportive	8	2.50	.89	5.46**
Supportive	37	3.21	.97	
Very supportive	36	3.83	.76	

Table 4.4i (cont'd)

DM by Level of CT Support	N	Mean	S.D.	F-Ratio
Monitor (Product-oriented)				
Level of Support for CT				
Not supportive	4	2.00	2.00	
Somewhat supportive	10	2.75	1.02	6.77**
Supportive	36	3.00	1.10	
Very supportive	37	3.81	.90	
Monitor (Process-oriented)				
Level of Support for CT				
Not supportive	4	2.81	2.11	
Somewhat supportive	10	2.70	1.01	5.62**
Supportive	36	2.88	1.03	
Very supportive	37	3.72	.81	
Evaluation (Process-oriented)				
Level of Support for CT				
Not supportive	4	2.00	2.00	
Somewhat supportive	10	2.70	.95	10.31**
Supportive	36	3.17	.96	
Very supportive	34	4.06	.84	
Evaluation (Process-oriented)				
Level of Support for CT				
Not supportive	4	2.75	1.94	
Somewhat supportive	9	2.47	1.04	7.71**
Supportive	36	3.05	.97	
Very supportive	34	3.91	.82	

** $P < .05$
N = 110 overall

Table 4.4j One-way Analysis of Variance of Level of Organizational Development Support for Product-oriented and Process-oriented Decision-Making (DM)

DM by Level of OD Support	N	Mean	S.D.	F-Ratio
Conceptualization (Product-oriented)				
Level of Support for OD				
Not supportive	4	2.93	1.78	
Somewhat supportive	24	2.84	1.19	4.82**
Supportive	44	3.47	.99	
Very supportive	19	4.03	.85	
Conceptualization (Process-oriented)				
Level of Support for OD				
Not supportive	4	2.56	1.94	
Somewhat supportive	24	2.83	.97	8.99**
Supportive	45	3.51	.87	
Very supportive	19	4.21	.74	
Design (Product-oriented)				
Level of Support for OD				
Not supportive	3	3.50	1.63	
Somewhat supportive	23	2.77	1.23	2.80**
Supportive	42	3.57	1.09	
Very supportive	18	3.66	1.19	
Design (Process-oriented)				
Level of Support or OD				
Not supportive	3	2.75	2.04	
Somewhat supportive	23	2.72	1.04	6.72**
Supportive	44	3.44	.86	
Very supportive	18	4.02	.87	
Implementation (Product-oriented)				
Level of Support for OD				
Not supportive	3	3.66	1.70	
Somewhat supportive	23	2.93	1.23	3.63**
Supportive	42	3.55	1.00	
Very supportive	18	4.02	.90	
Implementation (Process-oriented)				
Level of Support for OD				
Not supportive	3	3.00	1.73	
Somewhat supportive	22	2.810	1.01	7.63**
Supportive	42	3.42	.88	
Very supportive	18	4.18	.70	

Table 4.4j (cont'd)

DM by Level of OD Support	**N**	**Mean**	**S.D.**	**F-Ratio**
Monitor (Product-oriented)				
Level of Support for OD				
Not supportive	3	3.33	2.08	
Somewhat supportive	22	2.65	1.20	3.34**
Supportive	44	3.39	.96	
Very supportive	18	3.72	1.20	
Monitor (Process-oriented)				
Level of Support for OD				
Not supportive	3	2.91	2.00	
Somewhat supportive	22	2.53	1.11	6.78**
Supportive	44	3.28	.87	
Very supportive	18	3.93	.91	
Evaluation (Process-oriented)				
Level of Support for OD				
Not supportive	3	3.50	1.98	
Somewhat supportive	21	2.80	1.27	3.22**
Supportive	42	3.55	.86	
Very supportive	18	3.81	1.16	
Evaluation (Process-oriented)				
Level of Support for OD				
Not supportive	3	2.75	2.04	
Somewhat supportive	20	2.52	1.07	7.76**
Supportive	42	3.47	.87	
Very supportive	18	3.97	.89	

** P < .05

N = 110 overall

Research Cluster 4: Attitude Toward Computer-based Technology and Organizational Development Strategies.

This section concludes the analytical part of this research. That is, we initially examined the availability of different types of technologies and organizational development strategies. Next, we analyzed the technological change process relative to the organization's level of support and staff participation in the technological change process. Lastly, we focused on the decision-making process. Finally, we will briefly touch upon how attitudes toward computer-based technology and/or organizational development strategies can significantly influence the technological and decision-making process. The attitude scale was based on 36 questions: 18 oriented toward computer-based technology and 18 focusing specifically on organizational development. Both a t-test for paired differences and a reliability test were performed on the attitudinal measures. The results yield statistical significance ($t = 4.33$, $p < .05$) and high reliability coefficients at an alpha .90.

Correlational Hypothesis

Hypothesis 16:

> **Attitude toward computer-based technology and organization development strategies will correlate significantly with race, gender, hardware and organizational development strategies available, technological change and decision-making, and the amount of budget spent on computer-based and organizational development training.**

Table 4.5a yield results that show a positive correlation that is statistically significant with respect to attitude toward computer-based technology and organizational development strategies. The correlation between these two variables is $r = .69$, $p < .05$. For race and gender of recipients for services, European American females and Latino American females are positively correlated with attitude toward computer-based technology, representing $r = .20$, $p < .10$, and $r = .32$, p. 05, respectively. However, with respect to an attitude toward organizational development, percent minorities overall are positively correlated ($r = .20$, $p < .10$).

As we examine more closely race and gender percent breakdowns within the organization, we see another inverse correlation with percent European American employees and attitude toward computer-based technology ($r = -.30$, $p < .05$). Moreover, the percent of females overall is correlated with attitude toward computer-based technology ($r = .27$, $p < .05$) and well as organizational development strategies ($r = .26$, $p < .05$).

The availability of computer-based technology is also slightly correlated with attitude toward computer-technology ($r = .22$, $p < .05$). Certain components in the technological change process are also slighly correlated with attitude toward organizational development, such as with process-oriented adoption ($r = .21$, $p <$ 05) and implementation ($r = .21$, $p < .05$). The decision-making process is also positively correlated with both attitude toward computer-based technology and organizational development. Specifically, statistically significant correlations exist between attitude toward computer-based technology and organizational development with process-oriented conceptualization, process-oriented design, and process-oriented implementation. And finally, the amount of capital spent on training staff to perform basic organizational development is positively correlated with both attitude toward computer-based technology ($r = .23$, $p < .05$) and organizational development strategies ($r = .28$, $p < .05$). Thus, overall it appears that hypothesis 16 was only partially supported given that certain variables were not significant.

Table 4.5a **Correlations Between the Attitude Toward Computer-based Technology and Organizational Development Strategies with Gender, Race, the Availability of Technology, Technological Change and Decision-making Process, and Training**

	RESPONDENT'S ATTITUDE	
	Computer-based Technology (CT)	**Organizational Development Strategies (OD)**
Attitude toward Organizational Development Strategies	.69**	--
Race/Gender Recipients		
Percent minority overall	.13	.20*
Percent female overall	.14	.09
European American male total	.17	-.11
African American male total	.10	.17
Native American male total	.16	.29
Latino American male total	.23	-.20
Asian American male total	-.03	-.21
European American female total	.20*	-.12
African American female total	.11	.18
Native American female total	.11	.23
Latino American female total	.32**	-.03
Asian American female total	.21	.03
Race/Gender Employees Overall		
Percent European American male	-.30**	-.39
Percent European American female	.05	.01
Percent African American/other male	-.10	.05
Percent African American/other female	.00	.12
Percent female overall	.27**	.26**
Computer-Based Hardware Available	.22**	.07
Software Available	.19*	.18*
Organizational Development Available	.04	.23
Overall TC/DMP	.10	.08
Overall Product-oriented TC/DM	.04	-.02
Overall Process-oriented TC/DM	.15	.20*

Table 4.5a (cont'd)

	RESPONDENT'S ATTITUDE	
	Computer-based Technology (CT)	**Organizational Development Strategies (OD)**
Technological Change Process (TC)		
Innovation	.09	.07
Product-oriented	.06	-.01
Process-oriented	.12	.16
Adoption	.10	.10
Product-oriented	.02	-.00
Process-oriented	.18*	.21**
Implementation	.11	.09
Product-oriented	.06	-.01
Process-oriented	.16	.21**
Transference	.08	.16
Product-oriented	.01	-.06
Process-oriented	.16	.17
Decision-making Process (DM)		
Conceptualization	.17	.17
Product-oriented	.07	.04
Process-oriented	.25**	.29**
Design	.16	.11
Product-oriented	.08	-.01
Process-oriented	.24**	.24**
Implementation	.19*	.16
Product-oriented	.12	.02
Process-oriented	.25**	.29**
Monitor	.07	.05
Product-oriented	.06	.01
Process-oriented	.09	.10
Evaluation	.01	.01
Product-oriented	.01	-.04
Process-oriented	.00	.07

Table 4.5a (cont'd)

	RESPONDENT'S ATTITUDE	
	Computer-based Technology (CT)	**Organizational Development Strategies (OD)**
Training Budget		
Training staff how to use computers	.18*	.06
Training staff in organizational development	.23**	.28**

* P < .10
** P < .05
N = 110 overall

One-Way Analysis of Variance (ANOVA) Hypothesis

Hypothesis 17:

There are differences between genders and their attitude toward computer-based technology and organizational development strategies.

Table 4.5b is a one-way ANOVA that has differentiated between men and women respondents and their attitude toward both computer-based technology and organizational development. Thus, Table 4.5b appears to indicate that females are more likely to have positive attitudes toward computer-based technology and organizational development strategies. Therefore, hypothesis 17 is supported with respect to gender differences and their attitude.

Table 4.5b One-way Analysis of Variance of Male Versus Female's Attitude Toward the Use of Computer-based Technology and Organizational Development Strategies

Attitude by Gender	N	Mean	S.D.	F-Ratio
Attitude Toward Computer				
Male	52	3.80	.60	5.02**
Female	46	4.04	.42	
Attitude Toward Organizational Development				
Male	48	3.63	.51	5.71**
Female	46	3.87	.48	

** $P < .05$

Regression Hypothesis

Hypothesis 18:

The attitude toward computer-based technology and organizational development strategies correlate significantly with organizational characteristics for such variables as hardware, software, and organizational development strategies available, gross revenue, and percent of budget spent on computer-based and organizational development training.

This regression model being developed concludes our analysis. Further analysis was done to test our overall regression model which predicted that organizational factors would explain differences in attitude toward computer-based technology and organizational development. The characteristics of the organization included computer-based hardware, software, and organizational development strategies available, gross revenue, percent of budget spent on computer training and organizational development training.

Models were partially successful in predicting attitude toward computers and organizational development as a result of certain organizational factors. Tables 4.5c and 4.5d describe the model in predicting attitude toward computers and organizational development. The model in Table 4.5c explains 19 percent of the variation in the dependent variable (attitude toward computer usage). The overall regression model is significant at an alpha level of .05. Variables that fit the model were computer hardware, software, and organizational development strategies available, and percent of budget spent on organizational development training.

Table 4.5d, on the other hand, explains 15 percent of the variation in the dependent variable (attitude toward organizational development strategies). The overall regression model is significant at an alpha level of .10. The only variable which was held constant were software and organizational development available, and percent of budget spent on organizational development training.

In summary, both models reflect the importance of trying to predict attitude toward computer usage and organizational development. The need for differentiating between product-oriented and process-oriented technology is paramount to the development of a successful predictor model. However, given that our model did not hold together completely, we therefore reject our hypothesis in favor of the null hypothesis.

Table 4.5c Regression Model Predicting Attitude Toward Computer-based Technology

Attitude Toward Computer usage	Beta	t-value	t-sig
Intercept	3.52		
Computer Hardware Available	.47	3.17	.00**
Computer Software Available	-.21	-1.66	.10*
Organizational Development Strategies	-.25	-1.87	.06*
Gross Revenue	.13	1.20	.23
Percent Budget on Computer Training	-.02	-.19	.84
Percent Budget on OD Training	.23	2.00	.04**

$R^2 = .19$
F = 2.78 ($P < .05$)
t = * $P < .10$
t = ** $P < .05$

Table 4.5d Regression Model Predicting Attitude Toward Organizational Development Strategies

Attitude Toward Organizational Development Strategies	Beta	t-value	t-sig
Intercept	3.61		
Computer Hardware Available	.09	.59	.55
Computer Software Available	-.21	-1.63	.10*
Organizational Development Strategies	.11	.81	.41
Gross Revenue	.20	1.82	.07*
Percent Budget on Computer Training	-.05	-.48	.62
Percent Budget on OD Training	.25	2.15	.03**

$R^2 = .15$
F = 2 11 ($P < .10$)
t = * $P < .10$
t = ** $P < .05$

CHAPTER IV

DISCUSSION

Introduction (Review of the Research Study)

By convention, we will open up with this timeless phrase: the purpose of this study was to develop and test a theoretical model that centered around the technological change process in nonprofit human service organizations. To accomplish this end, it was necessary to conduct an empirical study on the technological state of nonprofit human service organizations throughout Michigan. Our aim was to examine, in detail, four main areas within the technological realm of the nonprofit sector.

First, we attempted to identify and differentiate between what the literature distinguishes as product-oriented and process-oriented technology. In effect, we were concerned with determining the availability and type of technology shared by nonprofits human service organizations. Secondly, our journey into this empirical abyss leads us in many different directions. The development of this technological change model grew out of the advice given by many with whom we came in contact. Identifying the process was, without a doubt, quite difficult; but how it related to staff participation in decision-making was even more complex. Thus, the third leg of our journey began. It centered around the decision-making process and how it related to both the technological change process and the support provided by the organization on behalf of technological and/or organizational change. This phase of the model became quite detailed. Finally, we were concerned with how attitudes toward computer usage and organizational development may affect their availability and practice.

Availability of Technology: Product-Oriented and Process-Oriented

Hypothesis 1

> **The availability of computer-based technology will be a statistically significant correlation with the availability of organizational development strategies.**

The results from this analysis indicated that the relationships were statistically significant. When the availability of either hardware, software, and/or organizational development strategies increased, their complementary technologies increased as well. With respect to the nonprofit sector specifically, one may further postulate that because of the availability of either one of these technologies, that the experience gained from one ultimately lead to venturing out to become acquainted with another technology. That is, as an organization (or organism) grows and expands, its need for knowing also expands. The self-actualizing nature of the nonprofit sector is a testament to this trait.

Hypothesis 2

The availability of computer-based technology will be a statistically significant correlation with product-oriented technological change processes.

The vast majority of the nonprofits studied had basic technology. The most consistent correlations where between product-oriented technological decisions and product-oriented technology itself. However, the converse wasn't necessarily true. That is, organizations who held substantial product-based technology were not so amenable to process-oriented technological decisions. It was rare to see the data even remotely indicate that organizational development technology affected the more product-oriented organizations. Thus, one may assume, hopefully not wrongly so, that as product-oriented technology increases in an organization, so to does its organizational development strategies, or the inverse as well. These findings suggest that organizations must be complementary, both technologically and organizationally.

Hypothesis 3

Statistically significant differences will exist between computer-based technology and organizational development strategies as they are correlated with specific technological change processes.

Theoretically, the technological change process should begin with innovation and end with transference. The point at which staff participate in the technological change process may depend, in part, on the type of technology in which they are asked to make decisions about. That is, the variation in decision-making participation by staff may depend on whether they are asked to 1) participate in making decisions about a computer-based product innovation; 2) participate in an organizational development innovation strategy meeting; or 3) a combination of both types of decision-making processes. Table 4.3c leaves one to ask the question why are there only correlations between computer-based technology and product-oriented technological change decision-making? This question adds a depth of complexity to our analysis especially since the availability of organizational development strategies is all correlated statistically significantly with each of the technological change processes, to include both the product and process components as well. One may assume that since the organizational development strategies are available that it enables staff to participate more, especially since the amount of capital to initiate an organizational development strategy is nominal at best and probably not as expensive or perceived as complex as a computer-based technological system.

Hypothesis 4

> **Computer-based hardware will correlate significantly with product-oriented decision-making while organizational development will correlate significantly with process-oriented decision-making.**

The decision-making process becomes even more detailed when examining product-oriented (i.e., computer) and process-oriented (i.e., organizational development) technology. Table 4.3d, not unlike Table 4.3c, also showed high correlation between organizational development strategies available and the decision-making process phases.

Explanations for these types of results are quite difficult to pinpoint. One may speculate that as the number of organizational development strategies increases in an organization that the more likely staff will be active in the technological decision-making process. That is, staff participation may become more broad because of the amount of intra-organizational interaction (specifcally, face to face interaction) due to the expanding nature of the work. Whereas with computer-based technology, the role of staff in the technological decision-making becomes quite narrowed. This may be because technology-based staff participation may not perceive themselves as being able to contribute, especially if their computer expertise is somewhat limited. Whereas with organizational development participation, it is generally assumed that "everyone" knows such strategies (although that is certainly *not* the case, as most managers will tell you). Ideally, one would hope that there would be an optimum number of staff participation and representation at all level of technology (be they organizational or technological).

Hypothesis 5

Racial and gender differences will show statistically significant correlations with both computer-based technology and organizational development strategies.

The issue of race and gender on the availability and use of computer technology is not new. Studies as far back as the early to mid 1970 to the present focused on personal differences such as gender and other overall demographics (Gattiker, 1988). Even within this study, there existed marked differences of the availability and use of technology and organizational development strategies on race and gender. As indicated in Table 4.3e, it appears as though the race of the recipient is positively correlated with the availability and use of both organizational development strategies and computer-based technology. A partial explanation for these results may be due to data configuration issues, or, even more peripheral, the argument that maintains that as the number of minority recipients increases, there may exist a need to keep up both organizationally and technologically in order to assure that their service needs are adequately met. On other hand, it may be partially explained by the fact that as the availability and use increases with these two types of technologies, the organization is more apt to increase its recipient number because of organizational and technological efficiency and productivity. Whatever the case, there clearly exists a relationship needing further study.

With respect to gender issues within the organization, the findings indicated a negative statistically significant correlation between female employees and the availability and use of computer-based technology and organizational development. Some possible explanations may be that as organizations become more technologically and organizationally sophisticated, women, who have traditionally been exposed less to work environments that are technologically sophisticated, are less likely to be working in such organizational settings. On the other hand, since this is simply a correlational technique, as the number of females increases the overall amount of technology and organizational development strategies used in their organization will be less. Again, the explanations for these results are both broad and deep.

Hypothesis 6

Organizations who have available desktop computers will report significant differences in staff participation in overall product-oriented technological changes and decision-making processes than organizations who do not have desktop computers.

The availability of computer-based technology by some nonprofit organizations does not necessarily mean that there is an absence of available technology in organizations which do not have available computers. Quite the contrary, other technologies such as faxes, copiers, typewriters, wordprocessors, etc. are probably the types of technology that are available. Therefore, comparisons drawn between organizations with and without computer-based technology is appropriate especially since so many other types of technology need to be studied individually as well as collectively. The findings from this hypothesis may be partially explained by the fact that the Ns for organizations not having computers is quite small, thereby not fully representing the overall sample of organizations who do not have computers. Nonetheless, the differences reflected in this study may suggest, in part, that organizations that maintain more sophisticated technology find it essential to gain staff/organization support for both technological change and overall decision-making.

Hypothesis 7

> **Organizations who have available strategic planning will report significant differences in staff participation in overall product-oriented technological changes and decision-making processes than organizations who do not have strategic planning.**

The availability of organizational development strategies appears to encourage staff participation in technological decision-making. That is, organizations that have available organizational development strategies such as strategic planning are far more likely to have staff participate in the technological change process than organizations that do not have available such process-oriented strategies. The findings from this study support the notion that as organizations become more technologically driven and less organizationally driven, staff involvement in overall technological/organizational decision-making will be dramatically reduced. Thus, this postulate becomes obvious when simply differentiating between organizations which have or have no such organizational development strategies.

Technological Change Process: Innovation, Adoption, Implementation, and Transference

Hypothesis 8

> **The overall relationships between the technological change and decision-making processes will be statistically significant.**

The central theme of this research is on product-oriented and process-oriented technological change. Endemic to technological change is staff decision-making in the technological change process and the integration and differentiation between products and processes. The assumption inherent in hypothesis 8 is that there is a relationship between technological change and its complementary decision-making process. This may seem obvious, which it is, because of the collinearity shared within and between each process domain and construct. The positive statistically significant correlations identified in Table 4.4a clearly show significant relationships. This may be due, in part, to the nature of the measurement scale or the close relationship the technological change process has with the decision-making process. Note, however, that this relationship between hard (i.e., product-oriented) and soft (i.e., process-oriented) technology is reduced somewhat when correlated with one another. This helps, no doubt, to explain the difference shared between these two constructs.

For sake of clarification, staff participation in, for example, the innovation stage of the technological change process subsumes some or all of the decision-making phases, be they hard, soft, or a combination of both. The same goes for adoption, implementation, and transference. Whatever process is being investigated is inherently integrated with the decision-making phases as well. And, with respect to the decision-making process, comprising the conceptualization, design, implementation, monitor, and evaluation phases, each of these processes occurs both simultaneously and concurrently with the technological change process. Thus, now we can begin to see why the correlations are quite significant.

Hypothesis 9

Support for computer-based technological change will be correlated more significantly with the overall technological change process than support for organizational development change.

The relationships between support for computer-based technology and organizational development were all positive statistically significant relationships. These phenomena may partially be explainable by the fact that nonprofit organizations are inherently more participatory in their organizational and workforce structure. The level or type of support by the organization for technology or organizational development strategies helps explain more thoroughly why support for product-oriented technology (i.e., computers, for example) receives greater staff participation in technological change decision-making. That is, staff involvement in product-based technological decision-making is more highly correlated with the organizations support for product-based technology. Conversely, staff involvement also increases in process-oriented technological decision-making when the organization supports process-oriented (i.e., organizational development) changes. However, these correlations become a little more difficult to explain when, for example, the organization supports product-based technological change and is correlated with process-oriented technological decision-making by staff. Quite routinely, the correlations are lower and the same applies in the inverse. When the organization supports process-oriented technological change and is correlated with staff's involvement in product-oriented technological decision-making. We see again that the correlations are lower. Intuitively, one's best guess is that there exists a product-oriented and process-oriented technological change differential. In other words, there are inconsistencies with attitude, perceptions, and level of staff involvement in either product or process technological changes. Ideally, the best for all organizations to experience, and the nonprofit sector even more so, is to try and identify an optimum balance between both product and process changes.

Hypotheses 10, 11, 12, and 13 all hold to the same theme. Namely, that of examining the differences between the level of supportiveness in the organization for either product-oriented or process-oriented technological change and its relationship to the technological change process. Each of these hypotheses attempted to determine whether observable changes of support did and would exist within the organization across levels of support (i.e., "not supportive," "somewhat supportive," "supportive," and "very supportive.") and types of support (i.e., computer-based or organizational development based). The findings all indicated that there did exist differences in perception toward support for computer-based technological change or organizational development change. With respect to support for organizational development change, most of the groups within the organizations and across the technological change process seemed to support organizational development changes more than computer-based changes, based on their observable mean differences overall. This may be explained, in part, due to the fact that organizational development change appears to require little or no capital expenditures (though this is debatable); while on the other hand, computer-based change may require that organizations be restructured--physically--and investments made for their inclusion into the organization. In addition, perceptions that staff will be replaced or reduced in hours needed and fear of having to relearn something leads to consternation. These possible explanations aid in our preliminary understanding of the data. Supposition and experience are still driving forces that help us explain these relationships.

Decision-Making Process: Conceptualization, Design, Implementation, Monitor, and Evaluate

Hypothesis 14:

> **Support for computer-based technological change will be correlated more significantly with specific product-oriented decision-making processes than support for organizational development change.**

The decision-making process is quite similar to the technological change process. You can't have one without the other. The processes are very similar except that during the decision-making phase, people get involved, as opposed to simple ephemeral and linear processes. In other words, the technological change process is based on identifying a point(s) in space and time where change occurs. Whereas with the decision-making process, it's based on identifying a point(s) in space and time where people will affect and effect those changes, be they technological or organizational.

Hypothesis 14, as well as hypothesis 15, are both concerned with identifying how support for technological or organizational development change can or will influence the decision-making process. As mentioned earlier while discussing the technological change process, it appears as though computer-based support is highly correlated with product-oriented decision-making and organizational development support is highly correlated with process-oriented decision-making. Again, there appears to exist that "technological differential." That is, differences in support for either a technology or strategy has a relationship with differences in product or process based decision-making.

However, when support was collapsed into one category across both computer-based technology and organizational development strategies, overall support for change is more highly correlated with process-oriented decision-making. Conversely, the same observation was the case for the technological change process as well. Thus, we may speculate that nonprofit staff members are, at times, more likely to support organizational development changes as opposed to technological changes. This may be partially due to the fact that nonprofits have, from a historical point of view, been left to their own innovative nature. Technology was not always forthcoming so nonprofits had to improvise and readapt to their changed environment. It is only now that nonprofits are just beginning to recognize that technology cannot be avoided but must be embraced, but not at the expense of organizational development planning processes, such as that of strategic planning, financial management, program evaluation, and the list goes on.

The last section which follows focuses on attitude toward computer-based technology and organizational development. This section is quite apropos given that attitude will dictate whether nonprofit organizations will move in the direction of technology, organizational development, or an optimum combination of both.

Attitude toward Computer-based Technology and Organizational Development

This final section in our discussion of results focuses on attitude toward computer-based technology and organizational development strategies. The link between attitude and availability, support, technological change, and decision-making, and race/gender are the key relationships that need to be examined should we ever attempt to develop reliable predictor models. The overall correlations reflect the fact that attitude toward technology and/or organizational development has a relationship with certain organizational characteristics. A one-way ANOVA was performed clearly indicating that female respondents hold more positive attitudes toward both computer-based technological usage and organizational development strategies. How these results possible contradict other relationships in this study or other studies are beyond the scope of this discussion. Suffice it to say that gender is like any other variable that needs to be examined more thoroughly.

Finally, two models were developed whereby attitude toward computer-based technology was one and attitude toward organizational development was another. Suffice it to say that there were positive predictor attributes in the models, such as the availability of hardware, software, and organizational development, and percent of budget spent on organizational development training, with respect to computer-based attitudes. Whereas the model developed for attitude toward organizational development, software available, gross revenues, and percent budget spent on organizational development training held together through the process. However, in both models, it appears that software available and percent of budget spent on organizational development training were consistent. One may speculate that if capital resources are spent on more sophisticated software for training purposes and organizational development training overall that eventual attitudes toward both computer-based technology and organizational development strategies would change for the positive.

CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

Introduction

In conclusion, it would appear that the nonprofit human services sector has three distinct types of organizational structures existing within its domain. The first is more technologically oriented, relies more on the availability of product-oriented hardware and software to affect technological and organizational change. The second type would be more process driven. This organizational structure is more concerned with organizational development strategies available and process-oriented decision-making. And lastly, the third organizational type is a combination of both the technological and organizational development structures. This nonprofit structure optimizes its availability and use of technology, the practice of organizational development, and the integration of technological change with staff participation in decision-making. Though these three types of nonprofit organizations are not readily distinguishable, one would be able to effectively examine and categorize a nonprofit based on the model that has been tested and developed within this study. This could be achieved by first examining the availability of technology and organizational development strategies. Second, identifying the organization's unique technological change process. Third, detailing the organizations technological and organizational decision-making process. And fourth, examine the attitudes of staff toward computer-based technology and organizational development.

Recommendations

Based on the following study, it is first and foremost recommended that more research needs to be undertaken in the area of nonprofit organizational structures and technology. To date, there exists virtually no research addressing the technological change process and the nonprofit sector. The limited research currently identified throughout the literature simply focuses on the availability and use of technology. What is lacking is more sophisticated research on the integration of technology into nonprofit organizational structures with respect to their technological change process.

Second, it is further recommended that research in the area of attitudes toward information-based technology and organizational development strategies be studied concurrently. To separate the two is to not appreciate their relationship.

Third, training programs need to be developed that link and discuss the nature of technology and organizational development strategies within the nonprofit sector. That is, questions need to be asked: "How do we define technology within the nonprofit sector?," "What role does technology play in nonprofit organizational development?" "What is the relationship between product-oriented and process-oriented technology and their effect on the nonprofit sector?" These are but a few questions to be asked by both academics and practitioners, or, what some would call "scholarly-practitioners."

Fourth, academic departments with colleges and universities should not only develop management training programs, though they are certainly needed, but should also develop nonprofit technology programs that link, merge, and integrate management, organizational development, and technology into one overall module or curriculum.

Finally, more scholarly publications must be written on the changing nature of nonprofit organizations and technology. Foundations, government organizations, private philanthropic organizations, for-profit corporation, and educational institution must all be willing to invest time, money, personnel, and other resources toward advancing the nonprofit sector into the 21st century. This does not mean that every nonprofit should have a computer. Quite the contrary, this simply means that all potential resources by various donative sources must be assured that investments are being utilized to their maximum effect and potential.

APPENDICES

APPENDIX A

SURVEY LETTER TO

EXECUTIVE DIRECTORS

MICHIGAN STATE
UNIVERSITY

September 7, 1994

EXECUTIVE DIRECTOR
WASHTENAW AREA COUNCIL FOR CHILDREN
3540 DIXBORO LANE
ANN ARBOR MI 48105

Dear Executive Director

On behalf of the Nonprofit Michigan Project and the David Walker Research Institute, College of Human Medicine, at Michigan State University, we respectfully request your assistance in filling out the enclosed survey. The purpose of this survey to conduct a study of human service organizations throughout Michigan in order to better determine the types of technologies and their use in nonprofit human service organizations. Your participation will make a significant contribution to our study.

Enclosed in this packet is a survey to be completed by the Executive Director of your organization or a designee, three letters of support for this research by leading nonprofit organizations in Michigan, including the Michigan League for Human Services, the Michigan Nonprofit Forum, and the Accounting Aid Society, and a self-addressed, stamped envelope for returning the survey. It will take approximately 25 minutes to complete.

When filling out the survey, keep in mind that your participation is voluntary, and you may or may not choose to answer all questions. You indicate your voluntary agreement to participate by completing and returning the survey. All responses will be kept strictly confidential and all participants will remain anonymous in this study. Please return your survey by **September 21**. If you would like a copy of the study, please fill in the appropriate section on the survey. Your participation will help develop the nonprofit human services sector throughout Michigan and is strongly encouraged.

COLLEGE OF
HUMAN MEDICINE
David Walker Research Institute
West Fee Hall
East Lansing, Michigan
48824-1317
517/353-3014
FAX 517/353-2952

If you have any questions, please feel free to contact either Dr. George Rowan, Director of the David Walker Research Institute or me personally, Timothy A. Akers. We can be contacted on the address identified in this letter or by calling (517) 353-3014. Thank you for participating in this study.

Sincerely yours,

George T. Rowan

George T. Rowan, Ph.D.
Director

Timothy A. Akers
Principal Investigator

Enclosure

APPENDIX B

LETTERS OF SUPPORT

Michigan League for Human Services
300 N. Washington Sq. Suite 401 • Lansing, MI 48933 • (517) 487-[illegible]

September 7, 1994

Dear Nonprofit Executive Director:

For more than half a century, the Michigan League for Human Services has provided consultation, technical assistance and advocacy for Michigan's charitable organizations because we believe that the maintenance of effective and efficient charitable organizations is critical to the health and well-being of Michigan's residents. In many areas, technology is contributing to profound changes for nonprofits. The research study currently being conducted by the David Walker Research Institute and the College of Human Medicine at Michigan State University can provide valuable information to assist nonprofit organizations, funders and policy makers better understand the use of technology in the nonprofit human services sector, hopefully leading to further strengthening of the nonprofit sector.

We recognize that time is one of your most valuable resources, but your participation through completing the enclosed survey will help assure that the survey results reflect the wide diversity of nonprofit organizations in Michigan. Please take the time to complete and return the enclosed survey form.

Thank you for your assistance with this research effort.

Sincerely,

A. Marston

Ann Marston
President/CEO

Ann/Timakers pk

MNF

Michigan Nonprofit Forum

September 1, 1994

Dear Nonprofit Executive:

On behalf of the Michigan Nonprofit Forum, I am providing this letter of support for the research study being conducted by the David Walker Research Institute at Michigan State University. Enclosed is a survey to help the Institute further its research in understanding how nonprofit human service organizations use and perceive technology. As an advocate for the nonprofit sector, I strongly support this study and encourage your participation in it.

Technology is changing the face of the nonprofit sector, and more research is needed in this area to help funding sources and policy makers better understand the nonprofit human services sector. The findings from this research will enable organizations like your own to have a more powerful voice in the changing policies of the nonprofit sector throughout Michigan.

Thank you for taking the time to participate in this important and valuable study.

Sincerely,

David O. Egner
Executive Director

ref: survey.ltr/wrkg/mcd

AN ALLIANCE TO PROMOTE GIVING, VOLUNTEERING AND A STRONG, EFFECTIVE NONPROFIT SECTOR IN MICHIGAN
38 Kellogg Center • East Lansing, MI 48824-1022 • Phone 517/353-5038 • Fax 517/355-3302

Working in partnership with the Volunteers Centers of Michigan

ACCOUNTING
AID SOCIETY

One Kennedy Square
719 Griswold / Suite 1435
Detroit, MI 48226-3340

313 961 6257 Fax
313 961 1840

P.O. Box 431361
Pontiac, MI 48343

September 8, 1994

Dear Colleague:

We are providing this letter of support for the research study being conducted by the David Walker Research Institute at Michigan State University. As advocates and technical assistance providers for the nonprofit sector, we truly see the benefits to be gained by your participating in filling out this survey.

The purpose of this research is to better understand how nonprofit human service organizations use and perceive technology. We strongly support this study by the Institute.

Because technology is changing the face of the nonprofit sector, more research is needed in this area in order to help funders, policy makers, educators, and technical assistance providers become better informed. Therefore, if this research is to be beneficial, we encourage your organization to complete this survey and return it in the pre-stamped and self-addressed envelope. Again, your participation in filling out this survey is needed badly.

If you have any questions, please feel free to contact me at (313) 961-1840.

Sincerely,

Jeanne Vogt
President

JV/emw

Enclosures

jv survey ltr

APPENDIX C

SURVEY INSTRUMENT

NONPROFIT TECHNOLOGY IN MICHIGAN

A SURVEY OF NONPROFIT HUMAN SERVICE ORGANIZATIONS

David Walker Research Institute
College of Human Medicine

Michigan State University

SEPTEMBER 1994

sponsored by

Nonprofit Michigan Project

David Walker Research Institute

IMPORTANT DIRECTIONS

This questionnaire is being distributed to 590 human service organizations in Michigan. Your answers will be used in a study to determine the type of technology and its use in nonprofit human service organizations throughout Michigan.

- **Your answers will be kept completely confidential.** All questionnaires will be returned to Michigan State University in sealed envelopes and will be kept strictly confidential.

- **If possible, the questionnaire should be filled out by *one* person in your organization.** Ideally this should be the Executive Director, or another person who is knowledgeable of the budgets, clients, and types of technology used in your organization.

- **Please try to answer all questions.** Filling out the questionnaire is entirely voluntary, but complete responses are necessary for a valid study and we hope that you will answer as many of the questions as you can. If you have any questions or problems in completing the survey, please call

  Timothy Akers at (517) 353-3014, the David Walker Research Institute, College of Human Medicine, Michigan State University

- **When you are finished, please seal the questionnaire in the self-addressed, postpaid envelope that came with it and return it by mail as soon as possible.** Questionnaires should be returned to

David Walker Research Institute
College of Human Medicine
Michigan State University
West Fee Hall, 421
East Lansing, MI 48824-1317

This questionnaire has 7 sections

I Organizational Context
II Finances and Funding
III Technology and Organizational Development
IV Technological Change Decision Making
V Characteristics of the Population Served
VI Organizational Structure
VII Background Information

It should take about 25 minutes for you to complete. Thank you for your time and cooperation.

SECTION I: ORGANIZATIONAL CONTEXT

(Please note: Most questions in this survey should be thought of as referring to both paid staff (full- and part-time) and regular volunteers to the organization unless otherwise stated in a questions.)

Q-1. Local organization: *(Optional)*

Name ________________________________

Street ________________________________

City, State ________________________________

Zip ________________________________

Q-2. What year was your organization incorporated? ____________

Q-3. Which of these BEST describe your organization? *(circle one number)*

1 American Red Cross
2 Urban League
3 Salvation Army
4 Volunteers of America
5 Young Men's or Women's Association *(YMCA, YWCA, YWHA, YMHA)*
6 Neighborhood Center/Settlement House *(Missions & Neighbor Community Centers)*
7 Thrift Shops *(Second-hand and used clothing shops)*

8 Group Homes/Orphanages
9 Missing Persons Service
10 Child Abuse, Prevention of
11 Adoption
12 Child Day Care
13 Children's Service Agency, Multipurpose
14 Prevention of Adolescent Pregnancy
15 Youth Services, Multipurpose
16 Child Development Support Services

17 Family Life/Parent Education
18 Single Parent Agencies/Services
19 Family Violence Shelters & Services *(Including Battered Women & Children)*
20 Homemaker/Home Health Aid
21 Family Services, Adolescent Parents
22 Other, please specify________________________________

Q-4. Please note briefly any additional categories or other description that would help in understanding the *general* nature of your business.

____

Q-5. **What best describes the geographical area SERVED by your organization?** *(please circle only one)*

1 County or larger region
2 Area smaller than a county but larger than a municipality or other local Government
3 Whole city, township or village
4 City sub-area with more than 25,000 people
5 City sub-area with fewer than 25,000 people but more than 5,000
6 City sub-area with fewer than 5,000 people

Q-6. **What is the TOTAL NUMBER of staff** who are: ***(estimates are sufficient)***

____ **Full-time Paid Staff**

____ **Part-time Paid Staff**

____ **Regular Volunteers**

____ **Overall Volunteers**

SECTION 2: FINANCES AND FUNDING. ***Please give amounts to the nearest $1000***

Q-7. For the calendar or fiscal year of 1993, what were the total amounts of your organization's: *(Estimates are sufficient)*

	1993 Calendar or fiscal year
Gross annual expenses	____________
Gross annual revenues	____________
Total assets (property, equipment, etc)	____________
Total liabilities (loans, debts, etc)	____________

Q-8. In PART 1, please indicate, from Highest to Lowest, your organization's MAIN SOURCES OF FUNDING AND in PART 2 the *approximate* PERCENTAGE they contribute to your budget?
(Instructions: Example: Foundations = 1, 30 %, United Way (UW) = 2, 20 %, etc...)

	PART 1 Highest to Lowest RANK 1 thru 6	PART 2 PERCENTAGE CONTRIBUTED TO OVERALL BUDGET
1 Government Grants	____	____ %
2 Foundation(s)	____	____ %
3 Corporate Donations	____	____ %
4. Public Donations	____	____ %
5. Federated Campaigns (e.g., UW)	____	____ %
6 Fees for Services	____	____ %
7. Fundraising Activities	____	____ %
8. Investments & Endowments	____	____ %
9. Other. ____	____	____ %
		TOTAL = 100 %

Q-9. What standard office equipment does your organization have for use by you or other staff? *(circle Yes or No, and, if yes, please circle the amount of use.)*

			If YES, the technology is available, HOW OFTEN is it USED by staff?				
OFFICE EQUIPMENT	Technology Available ?		Never	About 1 time per Year	About 1 to 5 time per Month	About 1 to 3 time per Week	Daily
1. Video Machine (VCR, CAMCORDER)	Yes	No	1	2	3	4	5
2. Fax Machine	Yes	No	1	2	3	4	5
3. Telephone System with Conference Calling	Yes	No	1	2	3	4	5
4 Multiple Telephone Lines	Yes	No	1	2	3	4	5
5. Copy Machine	Yes	No	1	2	3	4	5
6. Typewriter	Yes	No	1	2	3	4	5
7 Voice mail	Yes	No	1	2	3	4	5
8 Car phone	Yes	No	1	2	3	4	5
9 Other ____	Yes	No	1	2	3	4	5

SECTION 3: TECHNOLOGY and ORGANIZATIONAL DEVELOPMENT

Q-10. Please circle either *YES* or *No* IF the following **COMPUTER HARDWARE OR SOFTWARE EQUIPMENT** is or is not ***available*** **in your organization, and, if you circled yes, please circle** ***HOW OFTEN*** **staff** ***USE*** **the computer equipment.**

			If YES, the technology is available, HOW OFTEN is it USED by staff?				
HARDWARE	**Computer Technology Available ?**		Never	About 1 time per Year	About 1 to 5 time per Month	About 1 to 3 time per Week	Daily
1 Desktop Computer	Yes	No	1	2	3	4	5
2 Portable Computer	Yes	No	1	2	3	4	5
3 Laser or Ink Jet Printer	Yes	No	1	2	3	4	5
4 Color Printer	Yes	No	1	2	3	4	5
5 Dot Matrix Printer	Yes	No	1	2	3	4	5
6 Color Monitor	Yes	No	1	2	3	4	5
7 Modem (Data/Fax)	Yes	No	1	2	3	4	5
8 Hard Drive	Yes	No	1	2	3	4	5
9 Tape Backup Drive	Yes	No	1	2	3	4	5
10 Scanner	Yes	No	1	2	3	4	5
11 CD-ROM	Yes	No	1	2	3	4	5
12 Mouse	Yes	No	1	2	3	4	5

SOFTWARE ***(Included in your organization's computer system or setup?)***

13 Spreadsheet	Yes	No	1	2	3	4	5
14 Painting/Drawing	Yes	No	1	2	3	4	5
15 Presentation Graphics	Yes	No	1	2	3	4	5
16 Word Processor	Yes	No	1	2	3	4	5
17 Financial/ Accounting	Yes	No	1	2	3	4	5
18 Entertainment/ Education	Yes	No	1	2	3	4	5
19 Desktop Publishing	Yes	No	1	2	3	4	5
20 Database Management	Yes	No	1	2	3	4	5

SOFTWARE	Computer Technology Available ?		Never	If YES, the technology is available, HOW OFTEN is it USED by staff? About 1 time per Year	About 1 to 5 time per Month	About 1 to 3 time per Week	Daily
21 Tax Planning/ Presentation	Yes	No	1	2	3	4	5
22 Computer-Aided Design	Yes	No	1	2	3	4	5
23 Personal Info Manager	Yes	No	1	2	3	4	5
24 Project Manager	Yes	No	1	2	3	4	5
25 Statistical Programs	Yes	No	1	2	3	4	5
26 Multimedia	Yes	No	1	2	3	4	5
27 Electronic Mail (e-mail)	Yes	No	1	2	3	4	5
28 Internet Service	Yes	No	1	2	3	4	5

Q-11. Based on *YOUR PERSONAL PERCEPTION*, please complete the following sentence by circling one number/response to the right of each statement which you think is the most relevant.

THE *USE* of *COMPUTER-BASED* (equipment) *TECHNOLOGY*...:

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1 Improves the quality of decision-making	1	2	3	4	5
2 Complicates the work environment	1	2	3	4	5
3 Allows staff to communicate more effectively *within* the organization	1	2	3	4	5
4 Increases the overall productivity of the organization	1	2	3	4	5
5 Is useless for our organization's purposes	1	2	3	4	5
6 Increases the organization's appearance of professionalism	1	2	3	4	5

THE *USE* of *COMPUTER-BASED* (equipment) *TECHNOLOGY* . :

		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
7	Prepares the organization for continuous changes in technology	1	2	3	4	5
8	Provides information to clients at a lower cost	1	2	3	4	5
9	Cost more than the organization is able to afford ...	1	2	3	4	5
10	Is more cost effective ...	1	2	3	4	5
11	Reduces the number of staff needed to operate the organization	1	2	3	4	5
12	Reduces overall time of routine work	1	2	3	4	5
13	Does not help the organization's overall performance	1	2	3	4	5
14	Improves the overall quality of service to the clients	1	2	3	4	5
15	Is of little value overall ..	1	2	3	4	5
16	Allows staff to participate more in decision-making ...	1	2	3	4	5
17	Allows separate organization's to communicate more with each other	1	2	3	4	5
18	Requires too much training.	1	2	3	4	5

		Yes	No
Q-12.	**Have you personally heard about the INTERNET?** *(please circle yes or no)*	1	2
Q-13	**IF YES, have you or your organization thought about how to use the Internet?** *(please circle yes or no)*	1	2

Q-14 IF YES, please specify ______________________________

Q-15. If you or your organization's staff USE the INTERNET, please indicate how beneficial the service is to your organization's needs.
(Please circle the number which best describes the Internet's benefit to your organization)

	Not Applicable	Not at all Beneficial		Beneficial		Extremely Beneficial
1 Networking with other organizations	1	2	3	4	5	6
2 Locating Funding/ Grant Information	1	2	3	4	5	6
3 Identifying potential employees	1	2	3	4	5	6
4 Community organizing	1	2	3	4	5	6
5 Other ______________	1	2	3	4	5	6

Q-16. **Please circle either *YES* or *NO* if the following *ORGANIZATIONAL DEVELOPMENT STRATEGIES/TECHNIQUES* are or are not *USED /PRACTICED* in your organization, and, if you circled yes, please circle *HOW OFTEN* staff *USE* the technique or strategy.**

If YES, the technology is available, HOW OFTEN is it USED by staff?

ORGANIZATIONAL DEVELOPMENT	Organizational Techniques Available ?		Never	About 1 time per Year	About 1 to 5 time per Month	About 1 to 3 time per Week	Daily
1 Strategic Planning Methods/Techniques	Yes	No	1	2	3	4	5
2 Financial Management	Yes	No	1	2	3	4	5
3 Accounting & Bookkeeping	Yes	No	1	2	3	4	5
4 Grant Proposal Writing	Yes	No	1	2	3	4	5
5 Project/Program Feasibility Study	Yes	No	1	2	3	4	5
6 Human Resource Planning	Yes	No	1	2	3	4	5
7 Fundraising Development Planning	Yes	No	1	2	3	4	5
8 Project Planning	Yes	No	1	2	3	4	5
9 Operations Planning	Yes	No	1	2	3	4	5
10 Project/Program Evaluation	Yes	No	1	2	3	4	5

Q-17. Based on *YOUR PERSONAL PERCEPTION*, please complete the following sentence by circling one number/response to the right of each statement which you think is the most relevant.

IN GENERAL, the USE of ORGANIZATIONAL DEVELOPMENT TECHNIQUES or STRATEGIES...:

		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	Improves the quality of decision-making	1	2	3	4	5
2	Complicates the work environment	1	2	3	4	5
3	Allows staff to communicate more effectively *within* the organization	1	2	3	4	5
4	Increases the overall productivity of the organization	1	2	3	4	5
5	Are useless for our organization's purposes .	1	2	3	4	5
6	Increases the organization's appearance of professionalism	1	2	3	4	5
7	Prepares the organization for continuous changes in technology	1	2	3	4	5
8	Provides information to clients at a lower cost .	1	2	3	4	5
9	Cost more than the organization is able to afford	1	2	3	4	5
10	Are more cost effective .	1	2	3	4	5
11.	Reduces the number of staff needed to operate the organization	1	2	3	4	5
12.	Reduces overall time of routine work	1	2	3	4	5
13	Does not help the organization's overall performance ...	1	2	3	4	5
14.	Improves the overall quality of service to the clients	1	2	3	4	5
15	Are of little value overall	1	2	3	4	5
16	Allows staff to participate more in decision-making	1	2	3	4	5
17	Allows separate organization's to communicate more with each other ..	1	2	3	4	5
18	Requires too much training	1	2	3	4	5

Q-18. In 1993, approximately what percentage of your budget was spent on ...

1. Purchasing Computer equipment .... ________ % ✍ ?
2. Training Staff how to use computers .... ________ % ✍ ?
3. Training Staff to do Organizational Development (e.g., Strategic Planning, etc).. ________ % ✍ ?

Q-19. Part 1: Please circle HOW OFTEN your organization's paid staff and regular volunteers are provided the following types of communication and training.

Part 2: Please *EVALUATE* each method as a means of effectively training your organization's paid staff and regular volunteers in either the use of computer-based equipment or organizational development strategies.

	PART 1 *HOW OFTEN*... (circle one number of each)					PART 2 *EVALUATION* (circle one number of each)			
	Never	About 1 time per Year	About 1to5 times per Month	About 1to3 times per Week	Daily	Poor	Fair	Good	Excellent
	✍	✍	✍	✍	✍	✍	✍	✍	✍
1 On the job training	1	2	3	4	5	1	2	3	4
2 Memorandums	1	2	3	4	5	1	2	3	4
3 Training manuals	1	2	3	4	5	1	2	3	4
4 Written procedures	1	2	3	4	5	1	2	3	4
5 One-on-one consultation	1	2	3	4	5	1	2	3	4
6 Focus groups	1	2	3	4	5	1	2	3	4
7 Workshops	1	2	3	4	5	1	2	3	4
8 Seminars	1	2	3	4	5	1	2	3	4
9 Conferences/ symposia	1	2	3	4	5	1	2	3	4
10 Other ________	1	2	3	4	5	1	2	3	4

Q-20. *Please answer this question if your organization has a computer*

How often are computers in your organization used for the following tasks?

TASKS	Never	About 1 time per Year	About 1 to 5 time per Month	About 1 to 3 time per Week	Daily
1 Writing letters or memos	1	2	3	4	5
2 Writing reports, grant applications or similar papers	1	2	3	4	5
3 Preparing newsletters, publicity, or other materials for distribution	1	2	3	4	5
4 Preparing graphics for display, presentation or other purposes	1	2	3	4	5
5 Mailing labels or similar purposes	1	2	3	4	5
6 Managing client lists, inventory or other databases	1	2	3	4	5
7 Budgeting or other accounting work	1	2	3	4	5
8 Statistical or other analytical uses	1	2	3	4	5
9 Local Area Networks (LAN)	1	2	3	4	5
10 E-mail (Electronic mail)	1	2	3	4	5
11 Internet Service (Commercial)	1	2	3	4	5
12 Internet Service (Public University or College System)	1	2	3	4	5
13 Commercial Dial-Up Service (Compuserve, AOL, Prodigy)	1	2	3	4	5
14 FreeNet or BBS	1	2	3	4	5
15 Commercial Database Service (e.g., HandsNet, Lexus, etc.)	1	2	3	4	5

SECTION 4: TECHNOLOGICAL CHANGE DECISION-MAKING

(Again these series of questions are based solely on YOUR PERCEPTIONS) *Instructions: After each question, please circle the number corresponding to the amount of decision making participation employees are involved in. For these questions "staff members" will refer to paid PROGRAM STAFF, SUPPORT STAFF, AND REGULAR VOLUNTEERS (Note: Organizational Development will refer to all the type of activities previously mentioned that are designed to help strengthen the overall performance of the organization.)*

PARTICIPATION IN <u>DECISION-MAKING</u>	No Decision <u>Making</u>		Moderate Decision <u>Making</u>		Great Decision <u>Making</u>
	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>

Q-21. HOW MUCH *DECISION-MAKING INPUT* DO STAFF HAVE WHEN *PARTICIPATING* IN *"<u>BRAINSTORMING</u>"* ACTIVITIES (E.G., THINKING/CONCEPTUALIZING) ABOUT:

1 new computer equipment for the organization?	1	2	3	4	5
2 new organizational development techniques, such as strategic planning, etc.	1	2	3	4	5
3 how to allocate time, finances, and human resources in purchasing/ Adopting new computer equipment	1	2	3	4	5
4 how to commit time, finances, and human resources in adopting organizational development techniques.	1	2	3	4	5
5 how the new computer equipment is to be used by the organization	1	2	3	4	5
6 how the new organizational development techniques are used by the organization	1	2	3	4	5
7. whether to move the new computer equipment or other technology to another location within or outside the organization	1	2	3	4	5
8 whether to train other staff members within or outside the organization in various organizational development techniques	1	2	3	4	5

PARTICIPATION IN DECISION-MAKING	No Decision Making 1	2	Moderate Decision Making 3	4	Great Decision Making 5
Q-22. HOW MUCH *DECISION-MAKING INPUT* DO STAFF HAVE WHEN *PARTICIPATING* IN *DESIGNING PLANS* (E.G., DRAFTING PLANS, RULES, FORMS, METHODS, ETC.)					
1 for new computer equipment	1	2	3	4	5
2 for New organizational development techniques	1	2	3	4	5
3 for allocating time, finances, and human resources in adopting new computer equipment	1	2	3	4	5
4 for allocating time, finances, and human resources in adopting organizational development techniques	1	2	3	4	5
5 how the computer equipment will be used/ Implemented	1	2	3	4	5
6 how organizational development techniques will be used/implemented in work design	1	2	3	4	5
7 for moving new computer equipment to another location within or outside the organization	1	2	3	4	5
8 for designing organizational development techniques for training staff either within or outside the organization	1	2	3	4	5
Q 23 HOW MUCH *DECISION-MAKING INPUT* DO STAFF HAVE WHEN *PARTICIPATING* IN DECIDING <u>SPECIFICALLY HOW THE IMPLEMENTATION</u> OF:					
1 new computer equipment would be used if available to the organization	1	2	3	4	5
2 new organizational development techniques would be used if available to the organization	1	2	3	4	5

PARTICIPATION IN DECISION-MAKING	No Decision Making 1	2	Moderate Decision Making 3	4	Great Decision Making 5

Q-23. HOW MUCH *DECISION-MAKING INPUT* DO STAFF HAVE WHEN THEIR *PARTICIPATING* IN DECIDING SPECIFICALLY HOW:

3 time, finances, and human resources are to be used for newly adopted computer equipment	1	2	3	4	5
4 time, finances, and human resources are to be used for newly adopted organizational development techniques (e.g., strategic planning, etc.)	1	2	3	4	5
5 computer equipment is to be implemented in the workplace (e.g., type of work, etc.)	1	2	3	4	5
6 organizational development techniques such as budgeting, long range planning, etc. are to be used throughout the workplace	1	2	3	4	5
7 computer equipment and other technology are to be located within the organization and applied to other organizations outside	1	2	3	4	5
8 the different types of strategic planning, budgeting, financial management, and other techniques are to be used by others within and outside the organization	1	2	3	4	5

Q-24. HOW MUCH ***DECISION-MAKING INPUT*** DO STAFF HAVE IN **MONITORING (e.g., watching over):**

1 new computer equipment that is available on the market	1	2	3	4	5
2 new techniques used by other organizations, such as feasibility studies, planning, etc.	1	2	3	4	5
3 the time, finances, and human resources needed after adopting new computer equipment	1	2	3	4	5
4 how the organizational development techniques will affect the workplace environment based on time, finances, & human resources	1	2	3	4	5

PARTICIPATION IN DECISION-MAKING	No Decision Making 1	2	Moderate Decision Making 3	4	Great Decision Making 5
Q-24 HOW MUCH *DECISION-MAKING INPUT* DO STAFF HAVE IN <u>MONITORING (e.g., watching over)</u>:					
5 how the computer equipment is being used/implemented in specific ways or the way it was intended	1	2	3	4	5
6 whether the implementation of budgeting, planning bookkeeping, and others have an effect on the overall organization	1	2	3	4	5
7 whether the use of computer equipment is being taught to other staff within the organization or outside the organization	1	2	3	4	5
8 whether organizational development techniques are being taught to others within or outside the organizations	1	2	3	4	5
Q-25. HOW MUCH *DECISION-MAKING INPUT* DO STAFF HAVE IN <u>EVALUATING (e.g., determine the outcome)</u>:					
1 whether new computer equipment is appropriate for the organization's goals and objectives	1	2	3	4	5
2 whether the various types of new organizational development techniques are appropriate to the organization's stated goals and objectives	1	2	3	4	5
3 whether time, finances, and human resources spent on the computer equipment are used as intended	1	2	3	4	5
4 whether the organizational development techniques are available to the organization if needed	1	2	3	4	5
5 whether staff use the computer equipment as it was originally intended to be used	1	2	3	4	5
6 whether staff are practicing the organizational development techniques taught to them	1	2	3	4	5

Q-29 Based on the approximate number of people your organization PROVIDES SERVICES to, what *PERCENTAGES* are:

1. European Americans (White) *(Estimates are sufficient)*
   Male ______ ✍? and Female ______ ✍?

2. African Americans (Black) *(Estimates are sufficient)*
   Male ______ ✍? and Female ______ ✍?

3. American Indians (Native) *(Estimates are sufficient)*
   Male ______ ✍? and Female ______ ✍?

4. Latino Americans (Hispanic) *(Estimates are sufficient)*
   Male ______ ✍? and Female ______ ✍?

5. Asian Americans/Pacific Islanders *(Estimates are sufficient)*
   Male ______ ✍? and Female ______ ✍?

6. Other, please specify______________________________
   (Estimates are sufficient)
   Male ______ ✍? and Female ______ ✍?

Q-30 **Please rate the quality of your organization's relationship with:**

(circle one number for each)

		Poor ✍	Fair ✍	Good ✍	Excellent ✍
1	The COMMUNITY its located in	1	2	3	4
2	The CLIENTS it serves	1	2	3	4
3	Volunteers	1	2	3	4
4	Paid Staff	1	2	3	4
5	Other Nonprofit Org's	1	2	3	4
6	Foundations	1	2	3	4
7	Local Government	1	2	3	4
8	Businesses in the area	1	2	3	4

SECTION 6. ORGANIZATIONAL STRUCTURE

Q-31. Please indicate whether your organization has AVAILABLE the formal documents listed AND whether your organization's personnel consider them IMPORTANT:

	Available Yes	Available No	Not Important	Somewhat Important	Important	Very Important
1. A Written Vision Statement	Y	N	1	2	3	4
2. A Written Mission Statement	Y	N	1	2	3	4
3. Employee's Manual	Y	N	1	2	3	4
4. Strategic Plan	Y	N	1	2	3	4
5. Job Descriptions	Y	N	1	2	3	4
6. Program Policies and Procedures Manual	Y	N	1	2	3	4
7. Accounting Procedures Manual	Y	N	1	2	3	4
8. Investment Policies Manual	Y	N	1	2	3	4
9. Technical Manuals for Computers	Y	N	1	2	3	4

Q-32. **In each category, please indicate the number of people in your organization WHO PROVIDE technical support/expertise for computer hardware and/or software?**

__________ **Full-time paid staff**

__________ **Part-time paid staff**

__________ **Regular volunteers**

__________ **We pay outside consultants**

Q-33. **Approximately, how many people *IN YOUR ORGANIZATION* are...**
(estimates are sufficient)

RACE/ETHNICITY	MALE	FEMALE
European Americans (White)	____	____
African Americans (Black)	____	____
Latino Americans (Hispanic)	____	____
American Indians (Native)	____	____
Asian Americans/Pacific Islanders	____	____
Other Minority	____	____

Q 34 Based on the services your organization provides, are job responsibilities and tasks SHARED by other staff members and regular volunteers OR are they more specialized and performed by only one or a few KEY PEOPLE?

		Never Shared	Sometimes Shared	Often Shared	Very often Shared
1	Budgeting decisions	1	2	3	4
2	Program management	1	2	3	4
3	Fundraising	1	2	3	4
4	Grantwriting	1	2	3	4
5	Strategic planning	1	2	3	4
6	Other________________	1	2	3	4

Q-35. Please CHECK each level of authority if the position exist in your organization on either a paid full-time or part-time bases.

(please check each position that exist in your organization)

Check ✓

1 ________ Project Manager(s)/Supervisor(s)

2 ________ Program Manager(s)/Supervisor(s)

3 ________ Program Director(s)

4 ________ Deputy Director(s)

5 ________ Executive Director(s)

6 ________ Vice President(s)

7 ________ President/CEO

8 ________ Other(s), please specify ________________

Q-36. How many other, separate Human Service Agencies does your organization operate in different locations?

____

Q-37. On average, how much education would you consider the following groups within the organization to have?

	Less than high school	High School	Some College	College Degrees	Advanced Degrees
Regular Volunteers	1	2	[illegible]	4	5
Support Staff	1	2	[illegible]	4	5
Program Staff	1	2	[illegible]	4	5
Management staff	1	2	[illegible]	4	5
Executive Staff	1	2	[illegible]	4	5
Board of Directors	1	2		4	5

Q-38 How many paid staff and regular volunteers report directly to the Executive Director?

✍

SECTION 7. BACKGROUND INFORMATION. *In order to find out how different kinds of people in nonprofit organizations feel about different technology issues, we would appreciate your answers to some background questions. As with all information in this survey, your answers to the following questions will be KEPT STRICTLY CONFIDENTIAL.*

Q-39. What is your age?

_______ years ✍

Q-40. Are you:

1 Male
2 Female

Q-41 What is your title?

_______________________ ✍

Q-42 Please circle your main position in the organization:
(circle only one)

1 Full time Paid
2 Part time Paid
3 Regular Volunteer
4 Board member
5 Other, please specify_______________________

Q-43 Overall, how long have you been with this organization?

_____ Years ✍

Q-44. What is your race or ethnic background? *(please circle only one)*

1 European American (White)
2 African American (Black)
3 Asian American/Pacific Islander
4 Latino American (Hispanic)
5 American Indian (Native)
6 Other Minority _______________

Q-45 Please circle the highest level of education YOU *completed?*
(circle only one)

1 Less than high school
2 High School
3 Trade/Vocational Tech. School
4 Some college
5 2-year Associates degree
6 Bachelor's degree
7 Law degree
8 Master's degree
9 Medical degree
10 Ph.D. or equivalent
11 *Other, please specify* ____________________

Q-46 Please circle the annual salary range of your organization's executive director in 1993?

1 $20,000 or less
2 $20,001 to $35,000
3 $35,001 to $50,000
4 $50,001 to $75,000
5 $75,001 to $150,000
6 Greater than $150,000

Q-47 If, for example, an annual one day conference on technology and the nonprofit sector was held in Michigan, would your organizational leaders, including yourself, attend? ***(Please circle your response)***

1 Yes ....> if yes, approximately how much would you consider to be a reasonable registration fee?
$ __________

2 No

Q-48 If you would like to have a summary copy of this study, please indicate by circling yes and providing your name and mailing address. ***PLEASE REMEMBER, as with all information in this survey, your answers will be <u>KEPT STRICTLY CONFIDENTIAL</u>***

1 Yes > Name ____________________

2 No Address ____________________

City, State, Zipcode ____________________

THANK YOU VERY MUCH FOR YOUR TIME!!!

APPENDIX D

REMINDER POSTCARD

DAVID WALKER RESEARCH INSTITUTE
Michigan State University
College of Human Medicine
421 West Fee Hall
East Lansing, MI 48824

Recently a survey was mailed to the Executive Director of your organization seeking your opinion on Nonprofit Technology in Michigan: A Survey of Nonprofit Human Service Organizations.

Because it has been sent to only a small number and represents only a sample of your select group, it is critical to our study to have your input. We would appreciate receiving your survey back by September 26. If you have already returned your answered survey, please accept our sincere apologies for this reminder card.

If by some chance you did not receive the survey, please call 517-353-3014 and we will send one out to you immediately. As I said before, your input is critical.

Again, thank you in advance for participating in our study.

George J. Rowan, Director

Timothy Akers, Principal Investigator

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