THE MANAGEMENT OF CHANGE IN THE INFORMATION AGE: APPROACHES OF ACADEMIC LIBRARY DIRECTORS IN THE UNITED STATES

A DISSERTATION

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To the Dean of the Graduate School:

I am submitting herewith a dissertation written by Zhixian Yi entitled "The Management of Change in the Information Age: Approaches of Academic Library Directors in the United States." I have examined this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy with a major in Library and Information Studies.

Keith Swigger, Ph. D., Major Professor

We have read this dissertation and recommend its acceptance:

Eileen McElhatt

Department Chair

Accepted:

Dean of the Graduate School

DEDICATION

To my parents, Limo Yi and Shuixian Chen,
thank you for your support, caring, and encouragement.

To my wife, Songying Zhou,
thank you for your continuous support and patience.

To my son, Shengzhe Yi,
thank you for your inspiration and assistance.

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ABSTRACT

ZHIXIAN YI

THE MANAGEMENT OF CHANGE IN THE INFORMATION AGE: APPROACHES OF ACADEMIC LIBRARY DIRECTORS IN THE UNITED STATES

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Rapid changes in information technology affect all areas of academic libraries, from acquisitions to cataloging, research, and online learning. To ensure that libraries run smoothly and meet the current needs of all students, faculty, and staff, directors must learn to effectively manage constant and evolving change.

Researchers Bolman and Deal studied numerous business and education directors and discovered that they used four distinct approaches when managing change: structural, human resource, political, and symbolic. Structural leaders rely on formal rules, while human resource leaders strive to satisfy human needs. Political leaders use power and conflict, while symbolic leaders create rituals and celebrate the future. When supervising change, leaders and managers used either one (single), two (dual), or three or more (multiple) of these approaches. The change was either planned or unexpected.

Using Bolman and Deal's research as a guideline, this study examines how academic library directors manage change. The study also examines the factors that may influence management approaches: (1) demographics (age, gender); (2) human capital (education, length of employment); and (3) library characteristics (size, type).

An email survey was sent to 1,010 directors randomly selected from various degree-granting colleges and universities within the United States; 596 (59%) responded. The survey was based on a review of library literature and on Bolman and Deal's change management model. Multiple choice questions tracked the directors' experiences with change management, the approaches used, and the factors that may have influenced these approaches. When applicable, directors were also encouraged to write their own views and experiences. This allowed for any "other" possible categories outside of the Bolman and Deal model.

The collected quantitative and qualitative data were analyzed using descriptive statistics (frequencies, percentages, means, standard deviations) and inferential statistics (bivariate crosstabulations, chi-square tests, correlations, binary and multinomial logistic regressions). Multinomial logistic regression was used to determine the relationships between a dependent variable with multiple categories and more than two predictors. The qualitative data from the open-ended questions were analyzed using content analysis.

Initially 18 directors, chosen by stratified random sampling, participated in a pilot study of the email survey via surveymonkey.com. Following their suggestions and comments, revisions were made to the survey before it was applied to the large-scale study in a similar manner.

This study has confirmed that change is generally managed in academic libraries from structural, human resource, political, symbolic or multiple perspectives. Most directors managed both planned and unplanned change and used multiple approaches.

The structural and human resource approaches were the most frequently used single approaches, although dual approaches were also common. A correlation and regression analysis confirms that demographics, human capital, and library variables play significant roles in managing change.

Regression results show that older directors were more likely to use multiple approaches during change management than younger ones. Directors who oversaw more subordinates were more likely to use multiple approaches to manage change in information technology, and to make change decisions than their counterparts. Those who worked for an institution offering a higher academic degree were more likely than their counterparts to use multiple approaches to plan change, and to resolve conflicts during the change process.

The results allow a better understanding of directors' attitudes, behaviors, and approaches to managing change in academic libraries. Directors may use the results to reflect on different options of management strategy and balance the weight of these influences. Librarians may better understand different management techniques and approaches. Hopefully, this study will stimulate more research on the subject.

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CHAPTER I

INTRODUCTION

With the rapid development of both information technology and the global economy, and increasingly intense competition for scarce resources, academic libraries are facing external and internal pressures for change. Ready information is now at everyone's fingertips: Internet information is so widespread, it has created an increased demand for prompt and responsive information service (Warnken 2004); patterns of scholarly and publication communication have changed; and many colleges and universities now offer long-distance education (Association of Research Libraries 1996). As a result, academic libraries are increasingly challenged to meet the demands of faculty and students (Parnell 2001; Malhan 2006). Given this situation, it is important that academic library directors identify necessary changes and manage them effectively.

Bolman and Deal (1984, 1991a) consolidated major schools of organizational thought into four relatively coherent perspectives: structural, human resource, political, and symbolic. These four "frames" characterize different vantage points for understanding managerial action. The researchers conducted empirical studies using interviews and surveys to confirm their model (Bolman and Deal 1991b, 1992). When managing change, leaders may use one, two (dual), or three or more (multiple) frames.

The reframing model was first introduced to the library and information science field by Head and Brown in 1995. Although there has been little research using this model within the library setting, its value was recognized by other researchers as well. Travica (1999, 174) noted that change within a library setting parallels developments and trends that are experienced by other organizations including reorganization of work, restructuring, and cultural changes. According to Fyffe and Kobulnicky (1999, 33), "successful change management in research libraries and research universities is the [result of] proper framing and resolution of choices."

More than 10 years later, however, little is known about how directors actually manage change and the factors that influence their approaches to managing change.

Research Problem

Change is a natural human experience that has been around since the beginning of time. "Throughout our lives, each of us experiences many forms of change: we grow physically, from child, to adolescent, to adult; we experience new skills, new ideas, new responsibilities, new expectations along this physical path; we make decisions as to what type of lifestyle, with its intrinsic moral and value systems, we will devise or follow" (Heichberger 1974, 205).

While many changes are natural, inner-directed processes, most change is not inner-directed indefinitely. Outside influences, such as parental beliefs and societal customs, needs, and expectations, intervene (Heichberger 1974, 205). Mass media

increases our awareness of what is happening around us and influences our actions or opinions concerning these changes. In the early 1970s, an era that now seems technologically antiquated, Heichberger (1974, 206) noted that "Change has become an emotionally charged, value-oriented issue which dominates much of human beings' time and consideration" (Heichberger 1974, 206). Today, however, humans are bombarded with technological change that occurs so rapidly, it may be distressing for many. No wonder that throughout history, there have always been intrasocial groups promoting change and other groups resisting change (Wallis 1970, 107). But this tug of ideologies is an important part of social change.

To cope with change, people must first detect change. Rensink (2002, 246) described the term "change detection" as primarily pertaining to "the visual processes involved in first noticing a change," which can be as simple as observing traffic. At first the change "appears unproblematic, but upon closer examination contains subtleties that may cause great confusion unless carefully handled" (Rensink 2002, 247). Change generally requires a "transformation or modification of something over time," and thus, an action or motion is then required to handle the change (Rensink 2002, 248). Rensink (2002, 249) describes the next aspect of change detection as "seeing a change in progress" and then "seeing that something has changed." And finally, it is important to distinguish between the change and the difference it has made.

Rensink's assessment echoes Aristotle's ideas of change documented thousands of years ago. In *Book Gamma of the Physics*, Aristotle recounted the major role that

change plays including the need to trigger action and then assess that action (Van Fraassen 1970, 11-12).

An academic library director, who readily observes when change is necessary, sets effective plans in motion to cope with the change, and understands that change affects staff members differently, is apt to successfully manage change.

This study examines how academic library directors report the way they manage large-scale change and why they make related managerial decisions. The study also attempts to determine any correlating factors that may influence the directors' approaches to managing change.

The information age has enhanced the nature of change. With the rapid development of information technology, such as web blogs, wikis, and podcasts, change in academic library settings now occurs more quickly and is more unpredictable. As Stueart and Moran (2002, 4) stated, "Not only is the future not what one could imagine it to be even five years ago, but the speed of change is increasing in all sectors of society."

Stueart's and Moran's views are echoed by other researchers. According to Nozero and Vaughan (2000, 416), "The academic library of the 21st century is an institution facing numerous challenges, both from within and from without. Change is constant and everywhere." Pugh (2000, 1) adds that "Change in library and information services is now different in nature and greater in extent than ever before." In addition, change is "not always amenable to the standard managerial responses" and may "require new ways of thinking about organizations" including information services (Pugh 2000, 3-

4). To achieve positive responses to change, a change leader needs to correctly understand the nature of change (Warnken 2004, 324) and how it varies (Cameron and Green 2004, 46).

Large-Scale Change: Change occurs on both a small-scale or individual level and on a larger scale such as a "wide-ranging, 'frame-breaking' transformational change" (Osborne and Brown 2005, 90-91). Large-scale change, which is addressed in this study, is a complex but necessary process to continuously meet the demands of faculty, students, and staff. Large-scale change simultaneously involves all library departments, resources, and services and transforms current resources and services to new or altered resources and services. Managing large-scale change is a complex process because it involves various tasks and affects the library staff. This process requires thorough planning in order to take into account all areas of the library that might be affected.

It should also be noted that change can be triggered by either internal or external forces. "Different types of change can provoke different attitudes and different behaviors" (Cameron and Green 2004, 46).

Positive and Negative Influences: Warnken (2004, 324) stated that "Change by its nature is disruptive and upsetting, but it is a force that we reckon with constantly." As change occurs, "it can have either a good or a bad influence on the library" (Curzon 2005, 6). Curzon further describes this influence:

> Positive change is anything that will be either immediately or ultimately beneficial to the library-for example, the influx of new monies, the approval of building plans, or the addition of new librarians. In these situations, most people will see the benefit and anticipate change gladly. Negative change, of course, is anything that

> will be harmful to the library. A 2.5 percent budget cut, a fire or flood, or other structural damage are all examples of negative change. When change is negative, the planning will be not different, but intensified. . .
>
> It is important to note that change is often ambiguous, that is, neither clearly positive or absolutely negative. For example, a new automated system, which is good for libraries, often has many negative aspects as the staff adjusts to changes. Building a new library is good, but the process is frequently traumatic. Even adding new staff, which should be a source of joy, can raise conflicts about which units will get the additional positions. A skillful manager looks for the positive in the negative, and the negative in the positive. . . (Curzon 2005, 6).

Large-scale change may include, but is not limited to, information technology, resources, services, budgeting, tasks, policy, facility, attitudes, behaviors, values, or personnel. Change involves the key elements of planning, decision-making, goal-setting, conflict approach, evaluation, and communication. Change management refers to the process of identifying the needs for change, planning and implementing the change, and evaluating both the proposed change and the results. Evaluation is necessary to reduce potential risk and unnecessary costs and to ensure that all goals have been met.

This study is descriptive and explanatory because it attempts to describe or analyze how academic library directors manage change and tries to explain what factors influence the approaches they are more likely to use in managing change. This study is not prescriptive since it does not try to prescribe which management approach is best or most effective.

Research Questions

In pursuit of the problem statement, two important questions emerge:

1. How do directors of academic libraries report the way they manage change?

2. What factors influence their approaches to managing change?

Significance of the Study

This study is significant for several reasons. First, the results are helpful to understand directors' attitudes, behaviors, and approaches to managing change in different types of academic libraries. Secondly, the study reveals whether some approaches to change management are more common than others and whether there is some consistency in change management among library directors. Thirdly, it is useful to see how the predictors play an important role in influencing directors' varying approaches to change management. Fourthly, the results of this study allow directors to reflect on their different options, balance the weight of these influences, and better understand which factors are most significant in explaining their approaches. Fifthly, the value of knowing how change is being managed lies in providing people with new knowledge and enabling people to gain a greater appreciation of directors' approaches used, and to manage change better in the future. The value of this study exists in linking theory to action using the reframing change model to examine directors' approaches used, and confirming that the important change management tools are structural, human resource, political, symbolic, dual and multiple approaches. Finally, the results may also help librarians better understand different management techniques and approaches. Hopefully, this study will stimulate more research on the subject.

Assumptions and Limitations

Information for this study was obtained by written responses to an email survey. This study made the following assumptions:

1. The respondents answered the survey questions honestly and accurately.
2. Academic library directors might use various approaches to managing change in different types of libraries.

This study had the following limitations:

1. The study was dependent upon the willingness and ability of academic library directors to respond accurately to the survey questions.
2. Academic library directors' views about how to manage change (as noted in the survey) might be different from the views of independent observers.
3. Directors' approaches to managing change were given for only one point in time.
4. Data in this study were collected from directors in libraries of doctoral-granting, master-granting, and baccalaureate-only colleges and universities. Accordingly, the results of the study might not be generalized to college and university libraries outside this classification.
5. Misinterpretation of the survey questions and personal bias might result in inaccurate responses.

Definitions

Academic library: An academic library is directly affiliated with a college or university and addresses the information needs of faculty, students, and staff. It varies in size depending on the scope of the academic institution.

Academic library director: As applied to this study, an academic library director manages an academic library affiliated with a college or university and holds a title such as director, dean, or university librarian.

Change (large-scale): Large-scale change is a complex yet necessary process that enables library resources and services to continuously meet the demands of faculty, students, and staff. Large-scale change requires extensive planning and transforms current library resources and services to new or altered resources and services. Large-scale change simultaneously involves the entire library system including all departments, resources, and services—information technology, budgeting, tasks, policy, facility, and attitudes, behaviors, and values of personnel.

Change management: Managing change encompasses identifying the need for change, planning and implementing change, and evaluating both the proposed change and the results of the change. Evaluation is necessary to reduce any unnecessary risk and cost and to determine if the change objectives are met.

Dual (two-frame) approach: This frame involves integration of any two of the Bolman and Deal approaches to change management: structural, human resource, political, symbolic, or other.

Human resource approach: Directors who follow this approach provide training and support for staff members who feel incompetent, needy, and powerless because of the change (Bolman and Deal 1984, 1991a, 1991b, 1992, 1997, 1999, 2003). In *Library Trends*, Jones (1989) first reported on staff training and support provided during information technology changes. Ten years later, Jones (1999) reviewed how this support helped the staff during these changes. Jones determined that staff training was a continued need.

Multiple-frame approach: This frame integrates any three or more of Bolman and Deal's approaches to change management: structural, human resource, political, symbolic, or other.

Political approach: Directors who use the political approach establish arenas to negotiate compromises, resolve conflicts, and form new coalitions during change (Bolman and Deal 1984, 1991a, 1991b, 1992, 1997, 1999, 2003). Branin (1996, 4) notes that "The Ohio Information Network (OhioLINK) and the Louisiana Academic Library Information Network Consortium (LALINC) provide fascinating case studies of how to manage change and complex political processes on a large scale."

Reframing: The term "reframing" refers to directors who purposely alter their current change management approach in some manner. This is also known as "use of multiple lenses" (Bolman and Deal 1991a, xv).

Structural approach: Directors who use the structural approach realign roles and relationships of staff to reduce confusion and unpredictability resulting from change

(Bolman and Deal 1984, 1991a, 1991b, 1992, 1997, 1999, 2003). The successful reorganization of the entire library system at the University of Minnesota (Bowers et al. 1996) and the reorganization of the University of Arizona libraries (Giesecke 1994) illustrate the use of this approach. The Association of Research Libraries (1996) cites 34 libraries that realigned staff roles and relationships while specific units, such as reference, cataloging, acquisition, interlibrary loan, circulation, and reserves, were experiencing change.

Symbolic approach: Directors who use the symbolic approach emphasize rituals, stories, and symbols to lessen the feelings of loss, an unavoidable byproduct of change (Bolman and Deal 1984, 1991a, 1991b, 1992, 1997, 1999, 2003). The Learning Services at Deakin University in Australia experienced successful cultural change through the identification of shared staff values (McKnight 2002).

CHAPTER II

REVIEW OF THE LITERATURE

A comprehensive literature search, which included computerized bibliographic databases and manual searches of books and journals, revealed that many current books and articles are concerned with change and change management. This chapter examines the following six areas of change: (1) definitions, (2) types of change, (3) reframing change model, (4) management of technological change, (5) management of change in academic library functions and other areas, and (6) management of change using structural, human resource, political, symbolic, or multiple approaches.

Definitions

For the purposes of this study, change and change management are defined as given above, under Definitions (pages 9-11). However, there are many alternative definitions of change. According to McKean (2005, 284), change is "the act or instance of making or becoming different; the substitution of one thing for another or an alteration or modification." Change is also defined from internal and external environmental perspectives as a kind of response or process of an organization to internal and external driving forces (Dalziel and Schoonover 1988; Prentice 2005).

Change management is mainly a process of managing, implementing, planning, and coordinating organizational changes. It can also be defined from the disciplinary perspective. As Worren et al. (1999, 277) noted, change management is "the discipline that ensures organizations and employees meet new and existing performance targets rapidly and effectively." Because change can be both positive and negative or disruptive, change management comprises both opportunities and risks.

Researchers also differ on how to assess the effectiveness of change management in terms of goal setting, decision-making, planning, evaluating, and resolving conflict. For instance, Kirkpatrick (1985, xi) focused on decision making and implementation, while Fyffe and Kobulnicky (1999, 33) emphasized correct framing and strategies. Bolman and Deal's (1984, 1991a, 1991b, 1992, 1997, 1999, 2003) research, however, emphasized a multi-frame approach. Effective change management views change as an event, factor, or force in all areas of management in order to attain the anticipated objective, meet the need for new resources and services, and evaluate change as the basis for future effective changes. This study does not measure the effectiveness of change; rather the study focuses on how people report they manage change and the factors that are associated with academic library directors' approaches to managing change.

Types of Change

A review of the literature shows that researchers classify and interpret types of change in different ways: incremental and step (Thomas 2001); planned and unplanned

(Stueart and Moran 2002); first order and second order (Mink 1993, Gilley 2001); structural, cost cutting, process, and cultural (Luecke 2003); or developmental, transitional, or transformational (Anderson et al. 2001). Stueart's and Moran's types of change might be useful because the researchers interpreted them from the vantage point of libraries and information centers. The other interpretations are not used in this study.

Because different types of change may require different managerial approaches, it is important to first understand and differentiate the types of change encountered in order to build successful managerial strategies (Luecke 2003, 8-9). Similarly, Thomas (2001, 25-26) advocated that an effective change process must successfully integrate change that occurs both incrementally and by steps. In his users' guide, Thomas describes incremental change as slowly occurring over time and eventually moving toward a specific outcome. Step change, however, first encompasses a planning stage, followed by all changes being made simultaneously. Incremental change may be more effective in different situations because it might avoid unanticipated risks.

On a variation of Thomas' interpretation, Stueart and Moran (2002, 14-15) classified change as planned or unplanned. Planned change, also called proactive or incremental, allows full staff involvement, resulting in "renewal or recommitment on the part of the organization and the people working on it" (Stueart and Moran 2002, 14-15). Lippitt et al. (1985, 119) further described planned organizational change as a logical and fixed pattern of "recognizing a problem, gathering data, making a diagnosis, planning a change action, and evaluating the results." Unplanned or reactive change takes place

amidst uncontrolled pressures for change or a mismanaged process (Stueart and Moran 2002, 14-15). These types of change are the foci of this study.

Change has also been defined as first order and second order (Mink 1993). Gilley et al. (2001, 23) described first-order change as "minor improvements and adjustments that occur naturally as an organization and its employees grow and develop." Second-order or transformational change involves "a comprehensive examination of an organization's culture, core processes, vision, mission, values, goals, and strategies" (Gilley et al. 2001, 23). Luecke (2003, 8-9) classified organizational change programs as structural, cost cutting, process, and cultural, while structural change encompasses mergers or acquisitions as management attempts to achieve greater overall performance (Luecke 2003, 8). Process change focuses on how to make processes more reliable, and/or less costly, cost-cutting focuses on elimination of nonessentials, and cultural change focuses on the human side of the organization (Luecke 2003, 9).

Ackerman Anderson (1986) defined the three most prevalent types of organizational change as either developmental, transitional, or transformational. Developmental change represents the improvement of an existing skill or performance standard that does not measure up to current or future needs (Anderson et al. 2001, 34). Transitional change replaces a current method of standard with a new one, and transformational change is a radical shift from one state to another (Anderson et al. 2001, 35, 39). These types of change might be managed in the academic libraries.

Reframing Change Model

The current literature indicates that there are five approaches to managing change: (1) upside-down thinking, (2) rational approach, (3) analysis-think-change approach, (4) see-feel-change approach, and (5) reframing approach.

The upside-down thinking approach advocated by Handy (1990) and Peters (1987) requires radical new methods of administering and approaching work in the midst of disorderly, unpredictable, and never-ending change (Branin 1996, 2). The rational approach, or how-to books for managing change, adopted more cautious and practical methods (Branin 1996, 2). The representatives of this approach, Charles Kepner and Benjamin Tregoe (1981), believed that although work situations certainly changed, "the basic elements of rational problem solving and decision making remain."

The analysis-think-change and see-feel-change approaches, introduced by Kotter and Cohen (2002, 11), suggest that "changing behavior is less a matter of giving people analysis to influence their thoughts than it is helping them to see a truth that will influence their feelings" (Cohen 2005, 6). These two approaches imply that efforts for effective change management should be logically and emotionally made from the human resource perspective.

Head and Brown (1995, 7) introduced the reframing approach, which was first established by Bolman and Deal (1984, 1991), for change management within the library setting. The reframing process helps managers make effective decisions when addressing library budget crises. Bolman and Deal's reframing approach concerns the change that

can be viewed and managed from a variety of frames: structural, human resource, political, and symbolic in addition to the integration of these four frames for effective practice. The reframing model helps change leaders and managers see and understand the problems in more comprehensive ways; view, diagnose, and manage change events from multiple angles; and implement changes with maximum acceptance.

Bolman and Deal's model is chosen because the literature describing empirical studies of managing change in academic libraries demonstrates that change is generally managed through structural, human resource, political, and symbolic approaches. The thinking and practice coincide with Bolman and Deal's model. It has also been found that there has been no research on the factors that influence academic library director's approaches to managing change.

The Bolman and Deal model is a comprehensive and useful tool for understanding managerial action. Each of the four approaches is a distinct perspective with specific identified behaviors and both positive and negative aspects (Bolman and Deal, 1984, 255; 1991b, 1997, 1999, 2003). The value of this model has been recognized by many researchers in other fields. Reframing is a powerful way to match change management approaches to the specific change situation. Reframing can be used to clarify a situation, generate options, and evaluate strategies by simply reviewing the frames that have been considered or ignored. Secondly, the reframing model allows the researcher to examine approaches being used to manage change and also enhances the

understanding of approaches that might be used. Finally, presenting the reframing model will enable library directors to look at change management through new lenses.

This study concentrates on Bolman and Deal's (1984, 1991a, 1991b, 1992, 1997, 1999, 2003) reframing change model, which views change from structural, human resource, political, and symbol perspectives. Bolman and Deal developed their four-frame model by first reviewing the literature, and then confirmed their model through empirical studies.

In their first publication, *Modern Approaches to Understanding and Managing Organizations*, Bolman and Deal (1984, 288) discussed organizational change and alignment in terms of these four approaches "corresponding to a basic organizational domain." In 1991, they confirmed the model through their empirical study of higher education administrators in the United States and Singapore and the various managerial approaches they used (Bolman and Deal 1991b, 1992).

The four approaches developed by Bolman and Deal (1984, 5) "are based on major schools of organizational research and theory." According to the authors (1984, 4), the approaches function as: (1) filters to examine issues in order to test suitability and permit others to pass through easily, and (2) tools to help people "order the world and decide what action to take."

Bolman and Deal introduced the reframing change model in *Reframing Organizations: Artistry, Choice, and Leadership* in 1991 and defined reframing as "the use of multiple lenses" (Bolman and Deal 1991a, xv). Each of these four approaches, as

detailed below, offers a distinct perspective with specific identified behaviors and positive and negative aspects. The resultant Bolman and Deal framework was designed as a comprehensive tool to understand managerial action.

In 1991, Bolman and Deal conducted empirical studies, including interviews and surveys, of higher education administrators, American and Singaporean school administrators, and international corporate senior managers (Bolman and Deal 1991b, 529; 1992). The detailed information on these empirical studies is presented under Reframing Change Model (page 56). They noted that various approaches were used to lead and manage, although gender did not appear to play a role in predicting respondents' approaches and effectiveness. The decisions, actions, and strategies of various change leaders depended on how change was framed and reframed (Bolman and Deal 1984, 1991a, 1991b, 1992, 1997, 1999, 2003).

Structural Approach

While the literature was limited regarding the structural approach, Bolman and Deal (1984, 198) were able to "make a few brief and impressionistic observations." They determined that the structural approach was based on a broader tradition in the field of organizational research (Bolman and Deal 1984, 191). The literature focused on three major conceptual strands:

- Organizational structure
- Impact of technology and environment on organizational structure and design
- Information processing and decision making

These three different strands shared the following common foundation (Bolman and Deal 1984, 192):

- Organizations are created and continue to exist in order to achieve common "goals set by legitimate authorities" (Bolman and Deal 1984, 196).
- Organizational structure and process are determined mainly by the organization's goals, technology, and environment.
- Even though an organization does not always react rationally, it is generally governed by "norms of rationality" and is intended to be rational.
- Goals, tasks, technology, and structures are the primary determinants of organizational behavior. The needs, capacities, emotions, and self-interests of individuals or groups are less significant.

The key limitation of this approach is that "the frame has largely ignored the impact of organizations on people and the question of how to make organizations better places for people to live and work" (Bolman and Deal 1984, 197).

The structural approach was adopted from views, concepts, assumptions, and ideas of rational systems theorists who focused on "organizational goals, roles, and technology" (Bolman and Deal 1984, 2). Theorists Frederick W. Taylor (1911) and Henri Fayol (1919, 1949) developed the scientific management approach, while German sociologist Max Weber (1947) advocated the bureaucratic model (Bolman and Deal 1984, 30-31). Taylor's (1911) method of scientific management mostly dealt with the study of the tasks and the labor division between managers and workers. Fayol's (1949)

main principles for managers focused on division of labor, authority, and responsibility. The major dimensions of Weber's (1947) model included labor division, rules, selection of personnel, and employment. Bolman and Deal (1984) consolidated these elements into the structural approach.

In 2003, Bolman and Deal (44-45) commented on the structural frame:

> The assumptions of the structural frame are reflected in current approaches to social architecture and organizational design. These assumptions reflect a belief in rationality and a faith that the right formal arrangements minimize problems and maximize performance. . .The structural perspective champions a pattern of well-thought-out roles and relationships. Properly designed, these formal arrangements can accommodate both collective goals and individual differences.

Structural leaders set directions, value analysis and data, and resolve change problems through the creation of new rules or restructuring (Bolman and Deal 1991a, 1991b). These leaders recognize that change may result in loss of clarity and stability and may also create confusion and chaos. To avoid confusion, it is necessary to communicate, realign, and renegotiate formal patterns and policies (Bolman and Deal 2003, 372).

Human Resource Approach

"The human resource literature has generated a substantial body of empirical research. It is safe to assert that the research is extensive, varied, and methodologically uneven" (Bolman and Deal 1984, 208). From this literature, Bolman and Deal determined that the relationship between the individual and organization, human needs, emotions, and abilities are central to the human resource theory (Bolman and Deal 1984, 201).

This approach is based on six related research strands found in the literature (Bolman and Deal 1984, 201):

- The relationship between the organization and the people within it is important.
- Individuals within organizations are important.
- Human and technical processes within an organization can be improved by using specific strategies and technologies.
- Participation and organizational democracy that deals with alterations in organizational relations.
- The interdependence between social and technical processes in work settings.
- Careers and career paths in organizations.

Bolman and Deal (1984, 202) determined that all the six research strands shared a world view that included the following four propositions:

- Organizations exist ultimately to serve human needs rather than vice versa.
- Organizations are critically dependent on their ability to make effective use of human energies and talents. Therefore, people have a critical impact on organizational processes and outcomes.
- People are dependent on organizations for meaning and satisfaction in their lives.
- If human and organizational needs are poorly synchronized, the people will be exploited and/or the organization will be ineffective. Conversely, if human and

organizational needs are well synchronized, both benefit. Humans are satisfied with their participation, and the organization effectively achieves its goals.

The main limitations of this approach are that human resource theorists seldom look closely at structural constraints and directly address the issues of power and scarce resources (Bolman and Deal 1984, 208).

Bolman and Deal (1984, 2) adopted the human resource approach from several human resource theorists who concentrated on "the interdependence between people and organization." Original concepts for this approach can be found in Abraham Maslow's (1970) theory of human needs and motivation, Douglas McGregor's (1960) Theory X and Theory Y, and Chris Argyris' (1957, 1964) theory (Bolman and Deal 1984, 63-75).

Maslow (1970) classified human needs into five fundamental categories: physiological; safety; belongingness and love; esteem; and self-actualization, which suggest that people are motivated by needs. McGregor's (1960) Theory X takes the stance that subordinates dislike work and resist change, and managers need to direct and control their work. His Theory Y proposes that "the essential task of management is to arrange organizational conditions so that people can achieve their own goals best by directing their efforts toward organizational rewards" (McGregor 1960, 61). Theory Y, which takes the opposite stance of the Theory X, implies that subordinates like work and can direct and control themselves. Argyris (1957, 51) proposed that people tend to develop "from the infant toward the adult end of each continuum, barring unhealthy personality development."

Bolman and Deal (1984) consolidated the key elements of all of the above theories into the human resource approach. They comment on the human resources approach (Bolman and Deal 2003, 115):

> Is the workplace really this bleak across the world? Are individuals simply pawns, sacrificed to collective purposes and casually cast aside when no longer needed? Is there hope that work can ever fully engage people's talent and energy? Such questions have intensified with globalization and the growth in size and power of modern institutions. How can people find freedom and dignity in a world dominated by economic fluctuations and an emphasis on short-term results? Answers are not easy. They require a sensitive understanding of people and their symbiotic relationship with organizations.

The central idea of this approach is "the interplay between organizations and people" (Bolman and Deal 1984, 64). Human resource leaders value feelings and relationships, and they lead through facilitation and empowerment (Bolman and Deal 1991a, 1991b). Change may result in people feeling needy, incompetent, and uncertain. When change leaders handle this issue, they need to consider the strategy of providing employees with training, participation, involvement, and psychological support (Bolman and Deal 1991a, 1991b, 1997, 1999, and 2003).

Political Approach

Related political literature comprised mostly case studies. Bolman and Deal (1984, 217) determined that scarce resources, power, conflict, and coalitions are central to political perspectives. In the 1980s, political literature fell into two main categories (Bolman and Deal 1984, 211):

- An emerging body of research that focused on political processes in organizations
- A neo-Marxian view that emphasized class stratification and power exercised by elites

This political literature shared four basic assumptions (Bolman and Deal 1984, 211):

- Many of the most important decisions in organizations involve the allocation of scarce resources.
- Organizations are basically coalitions that comprise a number of individuals and groups.
- Individuals and groups differ in their values, preferences, beliefs, information, and perceptions of reality. Such differences are enduring and difficult to alter.
- Organizational goals and decisions emerge from an ongoing process of bargaining and negotiation among major "players" and reflect the relative power that each of the players is able to mobilize.

This approach is limited by the fact that political perspectives "can focus so strongly on politics as to underestimate the significance of both rationality and collaboration in organizations, . . overstate the inevitability of conflict, and understate the possibilities for effective decisions and meaningful work" (Bolman and Deal 1984, 216).

Not surprisingly, political science serves as the foundation for the political approach (Bolman and Deal 1991a). Managers using the political approach need to

understand and manage power, coalitions, bargaining, and conflict (Bolman and Deal 1984). Bolman and Deal (1984, 109) summarize the political approach as the following:

> From a structural perspective, organizations are designed to be rational systems. The central question is how to design a structure that is appropriate to achieving the organizational purposes. The political frame views organizations as "alive and screaming" political arenas that house a complex variety of individuals and interest groups.

Political leaders advocate, negotiate, and value realism and pragmatism. They lead by networking, negotiating compromises, creating coalitions, and establishing a power base (Bolman and Deal 1991a, 1991b). It is inevitable, however, that change results in conflict between the winners and losers. To avoid conflicts, political leaders need to negotiate issues and establish new coalitions (Bolman and Deal 1991b, 1997, 1999, 2003).

As an example of how to negotiate and establish new coalitions, Bolman and Deal (1984, 109-110) cited Baldridge's 1971 political analysis of the university, in which universities were seen as configurations of "social groups with basically different life-styles and political interests" (Baldridge 1971, 23). Baldridge noted that each social group wants to have an impact on organizational decisions. This is accomplished by articulating interests, making an effort to translate interests into institutional policy, resolving conflicting forces into an accepted policy, and implementing decisions (Baldridge 1971).

Symbolic Approach

In 1984, "very few extensive empirical investigations" had used symbolic theories (Bolman and Deal 1984, 223), and even these scholars probably did "not view themselves as exemplars of a definable symbolic approach" (Bolman and Deal 1984, 217). However, "there is a body of related approaches that are compatible with the following set of premises about organizations" (Bolman and Deal 1984, 217-218):

- The meaning of an event is more important than what happened during the event.
- Events and meanings are loosely coupled. The same event may have different meanings depending on the interpretive framework through which it is viewed. The same meaning can be expressed through a variety of events.
- Symbols serve three major functions in organizations: (1) economy— (symbols respond to the human need for economy in information processing); (2) elaboration—(resolve ambiguity and give meaning to events); and (3) evaluation and prophesy—suggest how to feel and how to evaluate events and activities. Symbols provide purpose, faith, and positive myth.
- Many organizational phenomena that appear dysfunctional when viewed in light of their ostensible purposes are logical and predictable in view of their symbolic functions.
- The more ambiguous and uncertain an event or activity, the more it will attract symbolic elaboration, evaluation, and prophesy.

The problems with this approach are that there are two faces of symbols—camouflage and distortion versus embodiment and expression of meaning (Bolman and Deal 1984, 224). According to Bolman and Deal (1984, 224), "Symbolic views suggest ... that the 'facts' of the social world are the facts that humans have chosen to construct. That view can become a basis for optimism about the possibilities of organizational change ..."

Bolman and Deal adopted (1984, 151) the symbolic approach from theorists in a wide range of fields including sociology (March and Olsen 1976); political science (Edelman 1972); psychology (Freud and Strachey 1952, Jung and Franz 1964); and anthropology (Ortner 1973). Freud and Jung relied heavily on symbolic concepts to understand human behavior, and anthropologists have traditionally focused on symbols and their place in the culture and lives of human beings.

Symbolism cuts across disciplinary boundaries and creates a lens for viewing life in collective settings. "The symbolic frame centers on the concepts of meaning, belief, and faith" (Bolman and Deal 1984, 151).

Change may result in a loss of meaning and purpose (Bolman and Deal 2003). Symbolic leaders impart a sense of enthusiasm and commitment. They need to utilize myth, ritual, ceremony, stories, and other symbols to provide a shared sense of mission and identity and to reduce stress and ambiguity (Bolman and Deal 1991a, 1991b). A valued philosophy is to "help people let go of old attachments and embrace new ways of doing things" (Bolman and Deal 2003, 393).

Multiple Approaches

Leaders may also integrate three or more approaches (Bolman and Deal 1984, 278) when managing change. Bolman and Deal (1984, 4) advocated the multiple approach because "Understanding organizations is nearly impossible when the manager is unconsciously wed to a single, narrow perspective."

The four frames distinguish the way one views change. Each lens has its strengths and weaknesses as a tool for action and as an approach for framing change (Bolman and Deal 1984, 1991a). Bolman and Deal asserted that change leaders may integrate all four approaches and make "the sequential application of each frame to the same event or issue." An ignored approach may very likely be the one that results in failure or success of the change (Bolman and Deal 1991).

Bolman and Deal (1984, 292) described the following empirical studies by others who used or cited the multiple approach. Kotter (1982) conducted a longitudinal study of senior manager characteristics and found that they used the structural, human resource, and political approaches. In search of organizational excellence, Peters and Waterman (1982) interviewed and observed managers from 62 high-performing corporations. As cited in Bolman and Deal (1984, 280), Peters and Waterman summarized the three main features of high-performing corporations as (1) simple form and lean staff, (2) productivity through people, and (3) hands on or value-driven. These three features coincide, respectively, with three Bolman and Deal approaches: structural,

human resource, and symbolic (Bolman and Deal 1984, 280). These two empirical studies confirm that people use multiple approaches under the various circumstances.

Bolman and Deal determined several common strands during their literature review. In both their qualitative and quantitative empirical studies, the frame-related issues and actions obtained from participants coincided with and confirmed this schema.

(1) The organization theory and research strands reviewed by Bolman and Deal reflect this kind of schema instead of some other.

(2) In the qualitative study, the frame-related issues and actions obtained from participants' descriptions of situations in critical incidents coincided with this kind of schema instead of some other.

(3) Bolman and Deal's empirical studies combining the qualitative and quantitative methods confirmed this kind of schema instead of some other.

The strengths of Bolman and Deal's model are that it is a relatively coherent model developed following an extensive literature review and empirical studies. The studies combined both qualitative and quantitative methods, which coincided with the literature. While most studies or models focus on only one or two organizations' theory and research, Bolman and Deal's (1984, xii-xiii) model was extensive and comprehensive. Explicit attention was paid "to both the similarities and differences between public and private organizations" (Bolman and Deal 1984, xiii). Previously, the bulk of work in organization theory "focused almost exclusively on either the private or the public sector, but not both." (Bolman and Deal 1984, xiii). The Bolman and Deal

model provides empirically confirmed approach-related managerial action classifications for the key elements of planning, approaching conflict, evaluation, and communication during the change process. The weaknesses are that Bolman and Deal did not clearly define change, nor did they address the types of changes. In addition, they only examined how gender influenced leaders' frame use; they did not study other variables such as other demographic variable (age).

Managing Technological Change

Information technology covers broad areas such as telecommunications and networking, information delivery, office systems, expert systems, digitization, speech recognition, hardware and software, data formats, and database systems (Ingersoll and Culshaw 2004, xiii). Evolving information technology, frequently described in the literature, is the driving force for change in academic libraries and leads to corresponding changes in resources, services, and administration.

The literature on technological change can be classified into four main categories: (1) opinions on information technology, (2) rapidity of changes and symptomatic techno-stress, (3) empirical studies, and (4) management of technological change.

The first category, opinions on information technology, serves as a driving force for change in academic libraries. Opinions involve historical developments, changing roles, and impacts of information technology (Bryson 1990, Hallman 1990, Prentice 1990, Hearn 1996, Young and Peters 1996, Riggs 1997, Rubin 1998, Gallacher 2000,

Siddiqui, 2003, Ingersoll and Culshaw 2004, Warnken 2004). According to Rubin (1998, 58), technological developments produce both positive and negative changes, which suggests that information technology changes should be appropriately and effectively evaluated and managed. With advances and impacts of new technologies that bring about the changes in library collections, services, policies, resources, and staffing, "libraries find themselves having to look at their systems and processes in a very different way" (Warnken 2004, 322).

The second category is the rapidity of change in libraries and its symptomatic techno-stress exhibited by library employees (Poole and Denny 2001, 503). The application of information technology in libraries has spanned several rapid stages. In the 1950s, IBM worked with libraries to solve circulation control problems. Throughout the 1950s and 1960s, new information technologies were applied to the workflow and services, and in the 1960s, the machine readable cataloging (MARC) standard was developed. By the 1970s, library operations and services were greatly influenced by automation. In the late 1980s and the 1990s, academic libraries experienced rapid changes with the advent of personal computers and CD-ROMs (Ingersoll and Culshaw 2004, p. xiv).

Numerous researchers have conducted empirical studies on the impact of information technology on personnel, resources, services, and administration in the library workplace (Jones 1989, 1999; Klerk and Euster 1989; Marchant and England

1989; Palmini 1994; Winstead 1994; and Young and Peters 1996). These studies are briefly described below.

Jones (1989, 449) conducted a survey at three university libraries on support staff attitudes toward technological change. The results were exceedingly positive, although the collected demographic data were not used in analyzing other variables in this study. Ten years later, Jones (1999) surveyed these libraries using the same 1989 questionnaire with minor word changes. The staff's opinions and reactions to technological change were still positive. However, the data from the second part of the questionnaire, such as personal background, were not fully used to analyze other variables through inferential regression techniques.

Klerk and Euster (1989) surveyed 53 library directors regarding their views on technological changes in libraries. The main areas of change cited were the overlapping of social and technological services and the changing roles of library staff members. Because the inquiry was in the form of a letter to colleagues, it lacked validity and reliability.

The results of Palmini's (1994, 119) survey on the effects of computerization on Wisconsin academic library support staff indicated that workers were worried about new job duties as well as future changes in academic libraries. It takes time to adjust to technological changes in libraries, and participative management is the key to better adjustment (Marchant and England 1989, 469). However, Winstead (1998, 20) found that automation did not cause changes in the hierarchy of the library, and it did not have any

effect on interpersonal communication. Young and Peters (1996) used a survey to examine the nature, features, and impact of the emerging electronic text on academic libraries. The response rate was very low, however, and the researchers did not perform a quantitative analysis of data.

Finally, Poole and Denny (2001) addressed how technological changes are managed in community college libraries and learning resource centers. The results from their limited survey indicated that the staff were positive about technological change. Poole and Denny emphasized that in planning and implementing technical change, greater attention should be given to determining who would be directly affected by the change and who would benefit. The researchers noted that the staff should be included in making decisions, revising job descriptions, and experimenting with alternative reward systems (Poole and Denny 2001, 503).

As library patrons become increasingly dependent on the Internet as a research tool, libraries must keep abreast of technology changes (Ingersoll and Culshaw 2004, 1). According to Johnson (1988, 43-44), strategies for technological change should address communication, purpose, leadership, incentives, consequences, time, incremental implementation, collaboration, design, and training.

Change resulting from evolving information technology, one of the external forces that drives change in academic libraries, may be managed from different perspectives: downsizing and decentralizing, developing employees' new skills, decentralizing power, and redefining the meaning of work in high-technology

environments (Bolman and Deal 1991, 372). Information technology–enabled change may be managed theoretically and practically using a variety of change management model perspectives (Geyer 2002, 67). It should be noted, however, that current literature does not address the factors that affect academic library directors' approaches to managing change that is triggered by information technology.

Managing Change in Academic Library Functions and Other Areas

Most of the literature on change or change management centers on concrete academic library functions, "desired organizational responses to certain environmental stimuli," and "changes in library acquisitions, information services, and technology deployment to meet narrowly defined change imperatives" (Stephens and Russell 2004). This section summarizes research that describes change management within a library setting.

The literature on change management in acquisitions focuses on the impact of the Internet on the selection and ordering processes in academic libraries (Diedrichs 1996, Hollis 1998, Siddiqui 2003). In 1996, Diedrichs noted that the functions of acquisitions managers and some acquisitions departments may be expanded to deal with new arenas such as "document delivery, copy cataloging, outsourcing, and contract negotiation" (Diedrichs 1996, 237).

To better understand how the Internet and electronic publishing affected acquisitions, Hollis (1998) interviewed British acquisitions librarians from six academic libraries and from one publisher. At the time, Hollis found that participants did not use

the Internet frequently during times of change. Siddiqui (2003, 241) cautioned that to effectively manage change, acquisitions managers should improve their leading skills and qualities. When acquisitions managers are given primary responsibility for the change process, they should control and implement change according to the proposed model of managing change: conceptualization, department preparation, task force creation, planning, management of staff, implementation, and evaluation (Siddiqui 2003, 241).

Kelly and Robbins (1996) discussed the main changes in the future of library reference services and the changing roles of reference librarians. They determined that consumer analysis, library work standardization, and artificial intelligence may have some effective applications in reference services. Work by Kelly and Robbins was preceded and followed by several studies describing how to effectively manage change in academic library reference services (Odini 1990, Gilles and Zlatos 1999, Rogers and Kenney 2001).

Odini (1990, 9) summarized personal experiences and observations into four broad categories to consider when introducing any aspect of change: psychological, communication, motivation, and administrative. Gilles and Zlatos (1999) described the reorganization of reference services at Washington State University libraries from a structural perspective. Changes included the merger of two separate divisional libraries and the redefining of roles and duties of the head positions. To maintain updated reference services, eight Illinois academic libraries successfully collaborated to offer real-time, web-based reference services (Rogers and Kenney 2001).

Changes in university reference services, including online services for end-users and free Web service, have been growing since 1991 and focus on reference collections and services. As a result, "change in reference is evolutionary" (Sowards 2003). Given the technology revolution, it is crucial that live online reference services be established and maintained to manage change in reference information (Reiner and Smith 2003). Albanese (2005) noted that print in academic reference collections is stable, and digital service is preferred by students and faculty.

Zuidema (1999) discussed the framework and mechanisms used to reengineer technical service processes at the University of Illinois at Chicago during evaluation and restructuring. Zuidema found that reengineering helped the staff prepare for technological changes, thereby making the library part of the new flexibility (Zuidema 1999, 51). In this study, the traditional interlibrary loan department was effectively restructured to also include information delivery. The department was eventually moved to collection development services at the Auraria Library of the University of Colorado at Denver (Schafer and Thornton 1999, 25).

Warnken (2004) reviewed the literature related to technology and change management and provided many guidelines on effective implementation of change in academic library services. Warnken suggested that academic library resources and services should be examined from strategic, functional, and tactical perspectives. He also concluded that everything must be taken into consideration in order for change to be effective.

Mosenkis (2002) conducted an informal survey on how to deal with change in the workplace. The survey was limited to specific areas, and the guidelines formulated for coping with change were based on personal experiences of management and human resource consultants. The report mentions the interview method used, but there are no explanations about the study procedure.

Molaudi and Toit (2003) studied the extent to which change was being managed in academic services through a mail survey in South Africa. The researchers discussed types of change and change processes in addition to factors at the organizational level that are measured and observed in the planned change: size, performance, structure, policies, procedures, culture, and management style. The researchers found that communication is the most effective tool to use in managing change. In addition, it is very important for the heads of information services to develop the right vision to guide and direct all activities during the change progress. However, the survey sample size used in this study was very small, thereby affecting the study's validity and reliability. Demographic data was not collected, and it is not known whether this affected the study results.

Harer (2001) conducted a Delphi study to examine quality performance of academic libraries and to predict the change trends in services and programs. Not surprisingly, Harer determined that the Internet was the most significant driving force for change in academic libraries.

Related literature explores the changing roles of professional and paraprofessional staff in libraries (Johnson 1996; Simmons-Welburn 2000; Wilson 2003; Auster and Taylor 2004), some of which are described below. Changing roles can be effectively managed by first identifying the change and then communicating the nature and details of the change (Johnson 1996, 97). Using content analysis, Wilson (2003) surveyed and interviewed library staff regarding their changing roles in their work. Although the sample size was small, Wilson (2003, 81) noted the extent and breadth of change. Simmons-Welburn (2000, 11) found that newly designed or redesigned positions are effective ways to manage the changing roles of librarians and other professionals.

Managing downsizing is regarded as a subset of the more general problem of managing change (Auster and Taylor 2004, 14). Auster and Taylor surveyed academic librarians, received 1154 responses, and presented a comprehensive study of downsizing and how Canadian academic libraries adapted to change (Gold 2005). The findings of Burgin's (1997) survey of 45 academic and 74 public library directors concluded that academic libraries were more likely to experience downsizing than public libraries (32% vs. 24%). However, the inequality of the number of directors within the two groups may account for this limitation. It is not known what factors influence directors' approaches to managing change.

Managing Change through Structural, Human Resource, Political, Symbolic, or Multiple Approaches

Rapidly changing information technology has brought great transformations to all aspects of management in academic libraries during the past two decades. While some people may thrive on change, others may resist change, thereby creating more conflict (Evans et al. 2000, 116). Ingersol and Culshaw (2004, 1) caution that "libraries in the twenty-first century need to balance the strong external forces of change with the resistance to change." Consequently, effective change management requires analyzing the causes of conflict and correctly using strategies and techniques to handle conflict (Edwards and Walton 2000).

Comparing the four different approaches to managing change, Bolman and Deal (2003, 193) briefly summarized how the different leaders would respond in a similar situation. Suppose a group of graduate students want their university to become more democratic and responsive, but the faculty insist on tightening controls and standards. The structural leader will focus on finding the right solution based on sound analysis or better outcomes. The human resource leader will look at the needs and perspectives of each group, encourage productive dialogue, and try to find a mutually satisfactory solution. The political leader is more likely to view divergent interests as an enduring fact of life and be less optimistic about distinguishing better from worse solutions (Bolman and Deal 2003, 193). While Bolman and Deal do not address the symbolic leader in this scenario, we can surmise that the symbolic leader would create rituals to develop or

restate the university's vision and also discuss the university's identity, culture, or symbols so as to lessen the differences presented by both sides (Bolman and Deal 1991b, 515).

As mentioned previously, the literature describing empirical studies of the four approaches used within academic libraries is scarce and often outdated. Examples of each approach are described below.

Structural Approach

In 1996, the Association of Research Libraries conducted an empirical study and surveyed 53 of the 108 research libraries in the United States. Seventeen of the responding libraries had either completed library-wide reorganization within the past 3 to 5 years or were currently engaged in reorganization. Thirty-four libraries had reorganized specific units such as reference, cataloging, acquisition, interlibrary loan, circulation, and reserves. Information technology and declining resources were the key factors that drove the organizational changes, many of which were managed using the structural approach. The reallocation of personnel, funds, and resources were the main actions taken as a result of effective restructuring.

Documented empirical studies of the structural approach used to manage change date back to the 1990s (Stanley and Branche-Brown 1995, 424; Bowers et al. 1996; Duchin 1997, 141; Kingsley 1997, 145; Harris and Marshall 1998). These studies described how organizational goals were met when authorities managed change and

resolved conflicts within technical services divisions, functional organizational structures, and even entire academic library systems. Many of these studies, however, can be critiqued for some weaknesses.

In 1995, Stanley and Branche-Brown described the reorganization of the technical services division at the Pennsylvania State University (State College) libraries. The reorganization, which resulted in self-directed work teams, represented a major cultural change for the library system. According to Stanley and Branche-Brown (1995, 424), training and empowerment were the key elements of effective team work. "The success of each decision is directly related to the individuals involved" (Stanley and Branche-Brown 1995, 424). Unfortunately, the study did not collect demographic and human capital data that might have influenced participants' approaches to making correct change decisions.

The latest change management study in the 1990s was conducted in Canada by Harris and Marshall (1998). The researchers examined director, manager, and librarian perceptions of how change was achieved. Seven directors of academic and public libraries were interviewed and then responded to a mail survey. Of the 182 respondents, 31% worked in academic libraries and 69% worked in public libraries. According to 70% of the respondents, preparation, reengineering, and thorough examination of priorities were sound managerial approaches to problems; 86% of public libraries and 72% of academic libraries were already changing their approaches. When the respondents were asked how change was achieved, 27% replied that restructuring involved or would

involve a decrease in service levels (Harris and Marshall 1998, 572); 86% reported that restructuring had resulted or would result in reduced staffing levels (Harris and Marshall 1998, 573).

In Harris and Marshall's study, it is important to note that directors, managers, and librarians had different perceptions of change management. However, the study lacked validity and reliability because the number of subjects was too small, and there was an unequal number of respondents between the two types of libraries.

In 1997, Duchin studied changes in staffing, functions, workstations, and personnel training in a library technical services department at the City University of New York. A positive aspect of the changeover was management's capacity to foresee and determine when a change was necessary. Other positive aspects for staff included job enrichment and variation, enhanced influence, acknowledgement of their intellectual abilities, and reduced barriers between technical services and public services (Duchin 1997, 141).

The library staff at the City University of New York had both negative and positive experiences during the change. The staff had a difficult time anticipating changes; however, the administration's willingness and ability to alert the staff to potential changes and when they would occur helped ease anxiety (Kingsley 1997, 145). Kingsley concluded that the combined effort of all people involved in the implementation of major change was the key to success. Key points to consider during the change

management process are to make effective communications, involve staff from the beginning, and include acquisitions in the process (Boissonnas 1997, 154).

The entire library system at the University of Minnesota (Duluth) was effectively reorganized and managed by task forces in charge of the change (Bowers et al. 1996). Communication with staff was important. They were involved in the change process by completing attitude surveys and participating in focus groups and team building.

The reviewed studies of how to manage change in acquisitions, cataloging, or other technical services focus on restructuring (Boissonnas 1997; Gozzi 1997) and changes in staffing, functions, workstations, and personnel training (Duchin 1997) in addition to the problems of managing change (Kingsley 1997). The above research was based on case studies and descriptive. Boissonnas (1997), Duchin (1997), Gozzi (1997), and Kingsley (1997) each described the effects of change, summarized effective and ineffective techniques for managing change, mentioned the most positively or negatively perceived aspects in the change process, and offered some advice. These studies are without quantitative analysis and lack validity and reliability, however.

The traditional division of labor in academic libraries has often been the focus of discussions on change management. Buttlar and Garcha (1992, 2) examined the structured workflow of academic librarians, the extent that two-fold paths of traditional and public service have been integrated, and the responses of library administrators toward restructuring. They sent a mail survey to "a stratified sample of 138 state-supported college and university library directors." Ninety-three usable questionnaires

were analyzed. The results showed that 60 of the 93 libraries had maintained the traditional divisions with separate technical and public services, 30 libraries had partial integration of the functions, and 31 had completed reorganization within the last 5 years. However, the study neither collected demographic and human capital data nor addressed the factors that influenced directors' approaches to managing change. In addition, the report was filled with many minor statistical errors. For example, it was incorrectly reported that 60 of 93 libraries represented 65.2% rather than 64.5% (Buttlar and Garcha 1992, 6), and 24 respondents for "don't know" comprised 26.4% rather than 25.8% (Buttlar and Garcha 1992, 8).

Human Resource Approach

The variable of people is the most important one to be taken into account during change. This is appreciated by the human resource approach, which focuses on human needs and the relationship between organizations and people (Bolman and Deal 1991, 121; von Dran 2005, 177). Staff can help make the change successful, but change may cause them to feel incompetent, needy, powerless, and possibly resistant. According to Bolman and Deal (1991, 397), these problems can be handled by providing training and support for employees via the human resource perspective.

To be effective human resource managers, library leaders should have a good mastery of basic motivational and human resource theories. They should also understand that this approach comprises "diversity, changing roles of academic librarians and administrators, recruitment and selection, staff development, and ethics" (Simmons-

Welburn and McNeil 2004). To be successful in managing change, it is important to identify personnel who are for or against change, analyze reasons for the obstacles to change, and correctly use change agents (Von Dran 2005).

A few sources (Webb 1989, Hawthorne 2004, von Dran 2005) described the human resource perspective as it is used within the library setting. Webb (1989, 1-2) cautioned that libraries should address "the challenges faced by information services, the need to reallocate, reclassify, and retain existing staff, and the increasingly important role human resource specialists play in libraries in transition" (Webb 1989, 1-2). Hawthorne (2004, 185), Director of Library Human Resources at the University of California at Los Angeles (UCLA), acknowledged that every library must adequately cope with change in order to meet current needs. She highlighted the need for proactive management of change in libraries and the integration of human resource management and organizational development (Hawthorne 2004, 185).

Hawthorne (2004, 172) noted that the human resource function has expanded beyond administrative and operational roles to include more strategic responsibilities. This shift means that human resource practitioners must not only manage change, and they must also redesign jobs to fit in with the organization's new needs, develop new performance management systems, and design and restructure organizations (Hawthorne 2004, 174). Work teams are emerging as both libraries and corporations rethink the impact of employee involvement and contributions. While team contributions can have a dramatic positive effect, some teams fail at their objectives. What makes a difference

between team success and failure is adequate training in interpersonal skills, effective communication, active listening, problem-solving, and conflict resolution (Hawthorne 2004, 179). Integrating organizational development in human resource management "in libraries is not only possible and desirable but necessary to manage change and improve overall organizational effectiveness" (Hawthorne 2004, 183).

Giesela von Dran (2005), assistant professor and director of the Library and Information Science Program, School of Information Studies at Syracuse University, New York, team-teaches a course entitled Leadership and Change. von Dran (2005, 183) stresses that leaders and managers of change must understand their own capacity for change and their resilience in coping with inevitable stresses. As a result:

> Leaders of change have to be mentally healthy, creative, flexible, and optimistic... If their primary motivation is service to the organization and its constituencies and employees, then they will create environments. . .that enable employees to express themselves, grow as human beings, find ways to exercise their emotional as well as intellectual intelligence, and encourage them to serve the greater good (von Dran 2005, 183).

Political Approach

When dealing with change, political power is an important element worth considering (Atkinson 1990, 98). The political approach can be used on several levels. First, change agents at various levels of the library staff have different roles and responsibilities for managing change. If a manager does not have the primary responsibilities for change, he or she may need to turn to the top level of management, which may possibly be the board, the city manager, or a vice president. This may be

frustrating and possibly may seem futile (Curzon 2005, 106). Second, academic libraries depend on their parent institutions, and political realities, albeit frustrating, should be taken into account at all times while managing change (Curzon 2005, 106; Gallacher 2000, 16). The resultant frustration and change may cause conflicts. If handled well, the political perspective can create arenas where issues can be negotiated rather than being driven underground (Bolman and Deal 1991, 377).

How politics affects academic library systems is evident in Fatzer's (1996) comparison of higher education library systems in Louisiana and Ohio. Both states were faced with serious budget problems while attempting to improve academic library services. While the two states appear to have little in common, they were both able to work through complex, yet different, political processes and overcome financial crises. In the end, each state established a state-wide resource-sharing academic library consortia supported by electronic library networks (Fatzer 1996, 58). The two consortia provide fascinating case studies of how to manage change and complex political processes on a large scale.

Symbolic Approach

Understanding, managing, and coping with academic library change must address "the issues of structure, strategy, personality, and above all, organizational culture" (Edwards and Walton 1996). The symbolic approach acknowledges institutional identity, culture, or symbols such as an attachment to an old building on campus (Bolman and Deal 1991b). While changing allegiances from an old to a new building may be slow and

difficult, leaders use the symbolic perspective to counter the loss of meaning and purpose (Bolman and Deal 1991b, 377).

The symbolic approach provides the capacity to constantly seek, critically assess, and selectively incorporate new ideas and practices both internally and externally (Fullan 2001, 44). The key elements of culture—values, power, behavior, language, and traditions—are the soft information that is considered when managing change (Gallacher 2000, 21-22). Any academic library has its own core values, a list of standards, central beliefs, or operating principles (intangibles) held by the organization (Patkus and Rapple 2000, 197). To change any of these values, the change process must start with top management adopting and agreeing to be guided by a set of values (Fitzgerald 1988, 12).

Managing change from a symbolic perspective is widely explored in many fields, but to a much lesser degree in academic library science. Most of the literature on symbolic change in libraries is presented in opinion papers; there are few related empirical studies. In *Changing the Culture of Libraries*, Patkus and Rapple (2000, 199), librarians at Boston College, noted that core values provide a common vision for employees. As librarians seek to deal with constant change, the identification and adoption of fixed and unchanging core values may be the ideal strategy to embrace change successfully (Patkus and Rapple 2000, 203).

To back up their beliefs, the authors further described their personal experiences at Boston College library system. As part of a reorganization started in 1994, external consultants were hired to lead the staff through the change process. The reorganization

was assessed within the first year and then again three years later. Reassessment reports, which focused on several key areas, including values, people and skills, and communication, were reviewed by employees across the system. During this process, core values were the glue that held everything together (Patkus and Rapple 2000, 202).

Nozero and Vaughan (2000, 416), librarians at the University of Nevada, Las Vegas, described how their library system re-engineered change in the borrowing system by starting with an absolutely clean slate, only looking at what needed to be done, not at what was being done or what had been done. They noted that "by involving more staff in the design of the changes, many of the risks inherent in re-engineering" were avoided (Norezo and Vaughn 2000, 417). At the same time, the system instituted a process improvement of developing change in smaller, incremental steps. While many theorists believe that these two methods (re-engineering and incremental change) are polar opposites and cannot be done simultaneously, Boston College successfully used tactics from both theories (Norezo and Vaughn 2000, 421). The key to their success was the fact that top management supported the project and developed an institutional culture that not only accepted change, but welcomed it. (Norezo and Vaughn 2000, 420).

In 1990, Harvard College Library initialized a 10-year organizational development strategy of positive adaptation to change (Clack 1995, 146). Staff involvement was a key process. In initial focus group sessions, which involved staff members at all levels, the committees generated ideas and communicated them to all library staff. Individuals were encouraged to independently identify their values, which

were discussed at larger group sessions or "town meetings." The material was then synthesized by a steering committee, and finally a proposal was discussed and approved (Clack 1995, 148). "Through this inclusive process of discovery, the library, while evolving constantly in response to change in its environment, is supported by a values system that influences its policies and activities and guides its selection of priorities" (Clack 1995, 150).

Outside of the United States, the Learning Services at Deakin University in Melbourne, Australia, experienced cultural change (McKnight 2002). McKnight (2002) managed change through customer discovery workshops, strategic planning, performance tracking, and the identification of shared staff values. While McKnight held a number of positions at the university library, including directorship, obtained several degrees and awards, and belonged to many associations, it is not clear from the article if any of these factors influenced her approaches to managing library changes.

Multiple Approaches

There are multiple realities in all organizations, including academic libraries, and different people have different perspectives. Consequently, there are multiple approaches to managing change (Bowers et al. 1996, Bolman and Deal 1997, Worren et al. 1999, Nozero and Vaughan 2000, Tuominen 2000, Atkinson 2003). Reflecting on his personal management experience and a review of professional literature, Atkinson (2003, 38)

observed that holistic thinking is an effective way to manage change in academic libraries and information services.

Complete restructuring can combine unrelated processes into a more effective approach (Hobrock 1996, 176), and different perspectives, which may be adopted to plan and manage change successfully, offer different results (Bolman and Deal 1991, 323). Planning from a structural perspective helps set objectives and coordinate resources; a human resource perspective promotes participation; a political perspective develops arenas to air conflicts and realign power; and a symbolic perspective adopts rituals to signal responsibility, produce symbols, and negotiate meanings (Bolman and Deal 1991, 323). Changes in one perspective undoubtedly affect the others, and an approach that is ignored may very likely be the one that results in failure or success of the change (Bolman and Deal 1991).

Few empirical studies on the multiple perspectives within the academic library setting have been done in the United States (Bowers et al. 1996, Nozero and Vaughan 2000) or elsewhere (Smith 2001). The case study by Bowers et al. (1996, 133) demonstrates multiple perspectives of change management at the University of Minnesota libraries. The entire library system changed from a structural to a cultural perspective by creating task forces, building a team and communication, defining personal and institutional values, and developing skills of team members. As described previously, Nozero and Vaughan (2000) examined the plan and implementation of change from multiple perspectives, including the symbolic approach, at the University of

Nevada, Las Vegas, library system. The researchers analyzed the two seemingly divergent methods used: (1) re-engineering or a radical change approach and (2) process improvement or slow incremental change. The library system was successful in using polar opposite methods of change because top management was open to change and encouraged both change and communication with all staff members (Norezo and Vaughn 2000, 420).

Re-engineering was also adopted by the technical services department at Griffith University Library in Queensland, Australia, in order to automate repetitive processes and form a partnership for shelf-ready books (Smith 2001). The library underwent multiple approaches to meet these goals. The total staff was reduced by 50%, and the new section was organized into two self-managing teams. Each team was responsible for all its own functions, from acquisitions through cataloging. "The change in this section was as much cultural as structural" (Smith 2001, 81). The resultant streamlined process allowed a clear and continuous feedback mechanism for the technical services staff and senior management. Problem areas are now readily addressed, without time elapsing (Smith 2001, 92).

Summary

Table 2.1 (Appendix A) summarizes Bolman and Deal's (1984, 1991a, 1991b, 1997, 1999, 2003) reframing change model. Table 2.2 (Appendix B) outlines conclusions of the literature on change management in academic libraries. Most of the relevant

literature, including the literature reviewed for this study, addresses the topic of technological change and management of change in academic library functions. The literature mainly comprises research studies related to the key elements of definitions, types of change, reframing change model, management of technological change, and approaches to change management in academic libraries.

Although some studies address the management of change from structural, human resource, political, symbolic, or multiple perspectives, empirical studies are lacking. Most empirical research focuses on practice, is cross-sectional, and relies on surveys and case studies for data. While little is known about how directors approach change management, there are studies citing both positive and negative results of change.

The literature presents anecdotal and informal case studies of successful change management at several academic libraries. In these studies, little information is given about the factors that influenced change management approaches used by the directors or the demographic and human capital data which might influence participants' approaches to making correct change decisions.

On the negative side, according to Goulding (1996, 94), "Research indicates that 90% of change initiatives. . .fail. . .because human factors were not taken adequately into account." Another study notes that as many as 70% of new programs fail—from re-engineering and installing new technology to changing values (Washington and Hacker 2005).

Today, there is an increasing need for academic libraries to perform change projects in response to external and internal pressures. Because academic library directors play a key role in managing change, there is a need for research on the approaches used to manage change and the impact that directors' demographic and human capital data have on choosing these approaches.

The model, research, and literature provided in this chapter establish the foundation for this study. The study framework and hypothesis development are discussed in the next chapter.

CHAPTER III

STUDY FRAMEWORK AND HYPOTHESIS DEVELOPMENT

This chapter describes a study framework to determine academic library directors' approaches to managing change. A brief description of Bolman and Deal's reframing change model is given below, followed by the framework for this study. Hypotheses are formed as guidelines for the specific empirical tests presented in Chapter IV.

Reframing Change Model

First, it is important to understand the backgrounds of these two researchers. In 1984, Lee G. Bolman was an education lecturer at the Harvard Graduate School of Education and an independent management consultant. At Harvard, he taught many executive programs, and was faculty chairman for the Institute for Educational Management. Terrence E. Deal was a professor of education at Peabody College, Vanderbilt University. Before joining Peabody, he was a faculty member of the graduate schools of education at both Stanford University and Harvard (Bolman and Deal 1984, xix).

The institutions they taught at were on opposite ends of the United States, "two universities known more for their differences than for their similarities" (Bolman and Deal 1984, xix). Both researchers had developed separate theories about organizations,

which led to lively debates. These "differences flourished and collided" when they co-taught a class on theory and behavior at Harvard (Bolman and Deal 1984, xii).

In 1984, confidence in American institutions plummeted as the government tried to control large mergers. At the same time, demand for new ideas and insights about management and organization had reached a crescendo (Bolman and Deal 1984, xi). The public eagerly bought new books on how to find organizational excellence, become a sixty-second manager, build a corporate culture, or apprehend the mysteries of Japanese management (Bolman and Deal 1984, xi). Each expert had a different idea on how to address different issues, and their students were confused.

Together, Bolman and Deal began to study the popular literature, to determine if problems were being oversimplified or if central issues in management were being omitted. They sought "to provide a compact overview of approaches to organizations that are genuinely powerful for management" and in turn "present a framework that encompasses much of what is known and that helps to separate the topical from the enduring, the fads from the fundamentals" (Bolman and Deal 1984, xi). The researchers summed up their studies: "Along the way, we assess the strengths and limits of many recently popular books and ideas." (Bolman and Deal 1984, xi). Their goal was to produce a holistic way of understanding the complexities of modern organizations.

While reviewing the literature, Bolman and Deal noted that the field of organizational behavior was split into several major intellectual camps. Within each camp, the people shared a similar view of the world, studied similar problems, used

similar methods, and cited each other's accomplishments (Bolman and Deal 1984, 190-191). From there the researchers "grouped the intellectual camps into four major territories, each with its own set of assumptions and approaches" (Bolman and Deal 1984, 190-191). The ideologies of each group formed the basis of the Bolman and Deal framework.

Their first book had three major objectives: "(1) to provide a clear and readable summary and integration of the major conceptual perspectives in the field of organizations, (2) to focus on what organization theory says that is important and useful for managerial practice, and (3) to give equal time to private and public organizations" (Bolman and Deal 1984, xii).

As the researchers lectured on their model to their students and to managers in many organizations, Bolman and Deal learned that most managers had relatively limited view of organizations and that the majority of people they interviewed had negative experiences in organizations (Bolman and Deal 1984, 6-7). When the four frames were first introduced, they caused confusion and tension. However, as people became more comfortable with the frames and were able to apply them to real-life situations, they reported a liberating feeling of choice and power. "Our experience encourages us to believe that the frames have a wider audience than the participants in our courses and seminars. The frames can be helpful to any manager. . .They can even help in many of the informal settings" (Bolman and Deal 1984, 6-7).

After finishing the review of literature and consolidating major schools of organizational thought into four relatively coherent approaches, they conducted empirical studies that examined how leaders used different approaches to leading and managing in the United States and Singapore. Bolman and Deal's (1992, 315) investigations combined "qualitative and quantitative methods because both have advantages in studying leaders' worldviews." In addition, they confirmed their model by using the triangulation research method (Bolman and Deal 1991b).

In the first empirical study, Bolman and Deal (1991b) interviewed 208 education administrators from the United States and 220 school administrators from Singapore. Participants were asked to list critical incidents that described a situation. From these narratives, Bolman and Deal determined the different management approaches that were used and analyzed approaches that were prominent in critical incidents. Twenty-four percent of the higher education administrators used one approach when managing, while 50% used two approaches, and 26% used three or more approaches (Bolman and Deal 1991b, 516-517). However, this first empirical study was limited because Bolman and Deal did not examine the factors that influenced the approaches used.

In the second study, Bolman and Deal (1991b) surveyed 90 international corporate senior managers from 15 various countries, 145 American higher education administrators, 140 American high school principals, and 229 Singaporean school administrators. With American managers, the researchers noted higher scores on the structural and human resource frames than on the political and symbolic frames (Bolman

and Deal 1991b, 522). Again, the use of management approaches varied among the respondents. Interestingly, gender did not play a role in predicting respondents' approaches and effectiveness (Bolman and Deal 1991b, 529).

While these empirical studies supported the Bolman and Deal framework, their research had limitations. Empirical studies were not conducted for many years after their original model was developed. In these studies, the researchers did not examine other factors that influenced the approaches used except for gender. This is an area that still needs to be developed.

Bolman and Deal's (1984, 1991a, 1991b, 1997, 1999, 2003) framework model serves as the foundation for this study. The framework—structural, human resource, political, and symbolic approaches—was designed as a tool to understand managerial action and to "find clarity and meaning amidst the confusion" of organizational life (Bolman and Deal, 1991a, 38).

According to Bolman and Deal (1984, 255; 1991a, 1991b, 1997, 1999, 2003), each frame is a distinct perspective with specific identified behaviors and positive and negative aspects. Structural frame leaders may rely on formal rules and behaviors and organize workers to achieve positive results. To avoid potential confusion and chaos, structural leaders may realign roles and responsibilities to fit tasks and the environment. Human resource leaders may consider individuals as the heart of the organization, and they strive to satisfy human needs. To prevent workers from feeling incompetent and

needy, human resource leaders may maintain a balance between human needs and formal roles.

Political leaders may use power and conflict to meet the organization's needs. However, workers may not feel empowered, which creates more conflict. To prevent this problem, political leaders may redistribute power and form new coalitions. Finally, symbolic leaders may create rituals and celebrate the future, but they may have a difficult time letting go of the past. Maintaining an image of accountability and responsiveness may help create a balance.

In 1995, Head and Brown used a hypothetical budget crisis to apply the reframing model to change management within the library setting. Head and Brown acknowledged that the only certainty most librarians face is change (1995, 1):

> It is no longer sufficient for librarians to solely possess the knowledge and skills that enable them to maintain and efficiently distribute a high quality collection of books, periodicals, and other materials to meet information needs. Librarians must acquire management and leadership skills which prepare them to effectively carry out the change process.

Despite this suggestion, there has been little research using Bolman and Deal's model within a library setting. However, reframing has been used extensively to examine leadership reframing patterns of college and university presidents, deans, chairs of university departments, directors, principals, and executives in higher education (Burks 1992, Strickland 1992, Gilson 1994, Durocher 1995, Hollingsworth 1995, Davis 1996, Rivers 1996, Cantu 1997, Eckley 1997, Scott 1997, Mathis 1999, Mosser 2000, Small 2002, Bowen 2004, Griffin 2005, Harrell 2006, Pritchett 2006).

Reframing can be used in "a number of ways to clarify what is happening and [to] generate options. . .to evaluate strategies or advice by asking: What frames have been considered, and which have been ignored?. . .and to diagnose the multiple realities of the people with whom we interact daily" (Bolman and Deal 1984, 255). Reframing is a powerful way to match change management approaches to each specific change situation, to examine different approaches used for change management, and to enhance understanding of more effective approaches to change management.

Study Framework and Hypotheses

Bolman and Deal's model is the guiding force behind this study, which also collected information via surveys. The framework for this study primarily tests the relationships between directors' different approaches to change management and three categories of variables, (1) demographics, (2) human capital, and (3) library characteristics. Demographics include gender and age of directors. Human capital comprises education level, years at present position, number of different positions, years of directorship, years of service, and number of subordinates. Library variables consist of number of library branches, type, and size.

Directors manage change based on many reasons including their work circumstances and needs. However, director demographic data and human capital and library characteristics may play a role in managing change. According to Davis (1996, v), "Women reported using all four managerial frames more often than men who reported using one or two frames more frequently." It is hypothesized that females are more likely

than males to use multiple approaches to manage change. Young directors may use only one approach when managing change because they may have less experience managing change and thinking about issues related to change. It is hypothesized that older directors are more likely to use multiple approaches to manage change than younger ones.

It is hypothesized that directors in the following situations are more likely to use multiple approaches than any other type of approach when dealing with change than their counterparts:

1. Directors with a higher level of education possibly have acquired knowledge of different approaches.
2. Directors who have been in their current positions, directorship, or service for longer periods of time may build on rich past experiences and may have dealt with and thought about many issues, including "structure, needs, conflict, and loss" (Bolman and Deal 2003), when managing change.
3. Directors who have held several different positions are more likely to have experienced more changes, thought about more issues, and possibly used different types of approaches.
4. Directors who oversee more subordinates and locations may have experienced and managed more changes. Directors who supervise more subordinates may have experienced more alignments of roles and responsibilities and interpersonal interactions.

5. Directors with more enrollments are more likely to have experienced and managed more changes (Euster 1987, 79).
6. Directors who work for an institution offering a higher academic degree may have experienced more library-wide reorganizations (Association of Research Libraries 1996).

This study was designed to test the above hypotheses and to determine what hypotheses would be accepted or rejected using the results of correlations, chi-square tests, and binary and multinomial logistic regressions.

CHAPTER IV

METHODOLOGY

This chapter details the study's methodology including the population, survey, pilot study, and variables and measurements. The chapter concludes with an outline of data analysis and analytical strategies.

Population and Sample

According to the Carnegie Classifications of Colleges listed in the *2008 Higher Education Directory* (Burke 2008, xlix), the United States has 1,591 colleges and universities. The total number of schools excludes associate colleges, special focus institutions, and tribal colleges (Burke 2008, xlix); US service schools; and US institutions in American Samoa, Federated States of Micronesia, Guam, Marshall Islands, Northern Marianas, Palau, Puerto Rico, and Virgin Island.

These US colleges and universities are classified into the following three major categories and nine sublevels (Tables 4.1 and 4.2):

1. Research universities: research I universities (RU/VH), research II universities (RU/H), and doctoral/research universities (DRU)
2. Master's colleges and universities: larger schools (Master's/L), medium-sized schools (Master's/M), and smaller schools (Master's/S)

3. Baccalaureate colleges: arts and science schools (Bac/A&S), schools with diverse fields (Bac/Diverse), and baccalaureate/associate schools (Bac/Assoc)

Academic library director names and email addresses were obtained from the *American Library Directory 2007-2008* and from library websites. Valid email addresses were readily accessible for 1,028 directors. Using a stratified random sampling, 18 directors were selected to participate in a pilot study (Table 4.1). The remaining 1,010 directors were invited to participate in the large-scale study (Table 4.2). All directors resided within the United States at the time of the survey.

Each prospective respondent of the pilot study was sent an introductory letter on June 20, 2008. The email contained a link to the designed survey via surveymonkey.com. The directors were asked to voluntarily participate in the pilot study, spend 15 to 20 minutes responding to the questionnaire, and return the survey within 10 days. Nine (50%) directors completed and returned a survey (Table 4.1).

Table 4.1: Response Rate for the Pilot Study

Overall Study			Pilot Study		
Classification of Institution*	No. of Schools*	No. of Valid Director Email Addresses	No. of Directors Chosen	No. of Responses	Response Rate (%)
RU/VH	96	81	2	2	100
RU/H	103	82	2	2	100
DRU	80	67	2	2	100
Master's/L	326	221	2	2	100
Master's/M	178	114	2	0	0
Master's/S	117	53	2	0	0
Bac/A&S	277	171	2	0	0
Bac/Diverse	310	207	2	1	50
Bac/Assoc	104	32	2	0	0
Total	1,591	1,028	18	9	50

Legend: No. = Number; RU/VH = research I universities (very high research activity); RU/H = research II universities (high research activity); DRU = doctoral/research universities; Master's/L = Master's colleges and universities (larger programs); M = medium programs; S = smaller programs; A&S = arts and sciences.
*Source: *2008 Higher Education Directory* (Burke 2008, xlix)

Following suggestions and comments by respondents of the pilot study, some revisions were made to the survey (see below). The revised survey (see Appendix D) was sent to the remaining 1,010 directors on July 5, 2008. An introductory email letter (see Appendix C) invited the directors to participate in the survey (via the surveymonkey.com link) and return the survey within 15 days. Reminder emails were sent to encourage participation, which was strictly voluntary. Completion of the survey was acknowledged by a thank you sent via surveymonkey.com. Respondents who emailed the researcher also received an email acknowledgement. In total, 596 (59%) directors completed and returned surveys in the large study by August 15, 2008 (Table 4.2).

Table 4.2: Response Rate for the Large-Scale Study

Overall Study			Large-Scale Study		
Classification of Institution*	No. of Schools*	No. of Valid Director Email Addresses	No. of Directors Chosen**	No. of Responses	Response Rate (%)
RU/VH	96	81	79	55	69.6
RU/H	103	82	80	51	63.8
DRU	80	67	65	39	60
Master's/L	326	221	219	122	55.7
Master's/M	178	114	112	67	59.8
Master's/S	117	53	51	32	62.7
Bac/A&S	277	171	169	95	56.2
Bac/Diverse	310	207	205	116	56.6
Bac/Assoc	104	32	30	19	63.3
Total	1,591	1,028	1,010	596	59

Legend: No. = Number; RU/VH = research I universities (very high research activity); RU/H = research II universities (high research activity); DRU = doctoral/research universities; Master's/L = Master's colleges and universities (larger programs); M = medium programs; S = smaller programs; A&S = arts and sciences.
[a]Source: *2008 Higher Education Directory* (Burke 2008, xlix)
[b]Excludes 18 directors chosen for the pilot study

The survey sample had both strengths and limitations. Although the pilot study included only nine subjects, they represented three major library categories and nine sublevels, as based on the Carnegie Classifications of Colleges listed in the *2008 Higher Education Directory* (Burke 2008, xlix). The survey sample was limited by the fact that it did not include directors from associate colleges, special focus institutions, and tribal colleges (Burke 2008, xlix); US service schools; and US institutions outside of the 50 states.

The large-scale study had a medium-sized sample. Incomplete surveys reduced the total responses to 455 subjects. In addition, data from 11 surveys were not included because the respondents did not hold the job title of directorship, deanship, or equivalent.

Survey

The survey (see Appendix D) has two sections. The first section asks 12 questions regarding personal (age and gender) and organizational (type of library, number of subordinates under control) information. The second section comprises three broad categories of quick-response questions about how directors manage change.

The first category of section two (nine questions) covers basic information: types of change managed, how change is managed (Bolman and Deal 2003), and director's roles in managing change (Moskowitz 1986). The second category (eight multipart questions) classifies directors' approaches to planning, goal setting, and decision making as well as in communicating with the staff. These questions, which are based on two scenarios adapted from Curzon (2005), are designed to gain insight into how directors use Bolman and Deal's four approaches to managing change (structural, human resource, political, and symbolic). The last category (three questions) asks the directors for comments on any approach they use to manage change, the survey in general, and whether they would like to receive a brief report of this survey.

The survey and content analysis instruments were developed primarily to examine what factors influence academic library directors' approaches to managing change. The survey instrument was created based on the review of library literature and Bolman and Deal's model.

To ensure the validity of the survey instrument, the five responses for each question in section two, category two, were organized according to the four Bolman and

Deal (2003) categories confirmed through the empirical studies. In addition, an "other" approach was added to account for people who use multi-frames. The responses were based on the researchers' classifications of the key elements such as planning, evaluation, and communication during the change process.

To further ensure the content-related validity of the instrument, a professor who teaches the Bolman and Deal model and an academic librarian were asked to judge whether the survey questions were capable of measuring directors' approaches to managing change. Both of them gave face-to-face feedback and offered valuable suggestions and corrections.

To ensure the reliability of the surveyed items, a pilot test was conducted after this study was approved by the Graduate School and the Institutional Review Board. The feedback from the pilot test was used to revise the instrument.

Pilot Study

A pilot study of 18 randomly selected academic library directors was conducted to ensure reliability of the instrument and clarity of questionnaire items as well as to estimate completion time. All respondents were asked to assess the appropriateness of the questionnaire to be used in the large-scale online survey and to provide comments, suggestions, and corrections concerning the survey questions and design. Respondents evaluated the format and content.

Nine respondents completed the survey. Only four directors freely provided comments regarding the survey questions and design. One respondent provided positive

feedback: "Good luck; I hope to see your results." The other three respondents gave the following written comments:

- "The samples are not suitable to me to evaluate or give comments."
- "I don't recall the question number [Question 3] but the question with the A-I was a little confusing. Not sure what you were expecting there – a rating of the different methods."
- "Question 6 is ambiguous. I answered as number of years in my current directorship. I have been a dean (or equivalent) for 18 years."

From the results, it appeared as if the other respondents understood question 3. This question was left as originally given for the large survey. However, question 6 was revised, and the respondents had to enter the number of years of all directorship, deanship, or equivalent.

The original pilot study survey asked respondents to write down their specific age. However, one respondent inadvertently entered the age of 10 years. Obviously this was inappropriate because the respondent also noted that he or she had 35 years of library service. A more appropriate age range for this respondent would be 55 to 60 years. Because of this error, respondents in the large study were asked to check an age range rather than write in a specific age.

The results of the pilot survey, including personal and organizational information and responses to the survey's questions, were not included in the results of the large-scale study for several reasons. First, the goal of the pilot study was to detect survey problems. Second, including these results might have affected the overall outcome of the actual

study. Finally, the stratified random sampling size was too small, and therefore the results were not reliable. For analysis of the results, see the corresponding sections in Chapters V and VI.

Variables and Measurements

The dependent variables are defined as the approaches used by the administrators during change management. These were measured by nominal variables. The five responses for each question in section two, category two, were organized according to the four Bolman and Deal (2003) categories in addition to "other" approaches. The responses were based on the researchers' classifications of the key elements such as planning, evaluation, and communication during the change process. Those who chose affirmative response one were classified as structural approach directors; response two, human resource approach directors; response three, political approach directors; response four, symbolic approach directors; and response five, other approach directors.

Respondents who chose just one of the five responses were classified as one-approach directors, and those who chose any two responses were classified as dual-approach directors. Respondents choosing three or more affirmative responses were classified as directors using multiple approaches.

The independent variables in this study comprise three categories: (1) demographics (gender and age of directors); (2) human capital (education level, years at present position, years of directorship, years of service, number of different positions, and number of subordinates); and (3) library variables (number of library

branches, type, and size). Table 4.3 provides more detailed information on the independent variables.

Gender is a dummy variable. Age, education level, and library size are ordinal variables. The respondent age is measured by a nine-point scale ranging from 25-29 (=1) to 66 or over (=9). Educational level is measured by a six-point scale. The library type is a nominal variable with three categories: baccalaureate schools, master-granting schools, and doctoral-granting schools. Library size is a four-point scale (a total student enrollment of <10,000=1, and a total student enrollment > 30,000=4. The predictors of years at present position, total years of directorship, total years of library service, number of different positions, number of subordinates, and number of library branches are continuous variables.

Table 4.3: Independent Variables Used in the Analysis

Gender
Age (9-point scale)
Education level (6-point scale)
Years of present position
Years of all directorship, or deanship (or equivalent)
Years involved in all library services
Number of different library professional positions
Number of subordinates
Number of library branches
Library type (3-point scale)
Library size (4-point scale)

Data Analysis and Analytical Strategies

The main method of this study's analysis was multinomial logistic regression, which was used to determine the relationships between a dependent variable with multiple categories and more than two predictors. Independent variables can be categorical and continuous variables. First, frequencies and other descriptive statistical methods were used to look at the distribution patterns of the individual variables. Chi-square tests were run to check variable associations. Bivariate correlations were run to check the relationships among the variables and determine if there was a multicollinearity problem. Multinomial and binary logistic regressions were done for the final step. This analysis created a full regression model, which included all predictor variables that were useful in determining library directors' approaches to managing change.

As verified by Trieman (2009), multinomial logistic regression was most appropriate for this study for the following reasons: (1) Dependent variables of this study are "categorical variables with more than two categories" (Treiman 2009, 335). (2) The procedure of multinomial logistic regression "involves simultaneously estimating a set of logistic regression equations" (Treiman 2009, 336). (3) One category of the dependent variable can become the reference category, and "The estimation procedure yields, for a set of ... categories for some dependent variable, ... logistic regression equations, each of which predicts the log odds of a case falling into a specific category rather than the reference category..." (Treiman 2009, 336).

This study had seven categories of dependent variables: structural, human resource, political, symbolic, and other approaches; dual-approach; and multi-frame approach. One category was used as a reference. Thus, six models could be developed and tested using dependent and independent variables. Even if respondents did not choose some of the dependent variables, other models could be created and examined.

In this study, some respondents did not answer the open-ended questions. These directors might have frame-related issues and actions that align with the conceptual definitions of Bolman and Deal's four approaches: structural, human resource, political, and symbolic. Or they might simply have been too busy to fill out the survey completely. Directors who responded to the open-ended questions did not have frame-related issues and actions empirically confirmed by Bolman and Deal. Instead, they used their own managerial actions to manage change. This was displayed from their specified approaches and open-ended responses.

The collected data from open-ended responses and questions were studied using descriptive content analysis (Sarantakos 2005, 300), which allowed the investigator to systematically analyze data collected from open-ended responses and questions (Nachmias and Nachmias 2000, 301). According to Sarantakos (2005, 300), content analysis "involves counting, listing, operationalising, and categorizing, as well as some evaluation and interpretation." Indeed, "The categories into which content is coded vary with the nature of the research problem and the type of data [acquired]" (Nachmias and Nachmias 2000, 301).

The content analysis of this study only focuses on free comments on the "other" approaches and the responses to the open-ended questions. This was useful in identifying other alternative approaches used or potential issues that directors might have faced in practice. Open-ended responses to the "other" approach were first analyzed according to themes and patterns and then by multinomial and binary logistic regressions. This approach involved the qualitative data collected from participants' specified own approaches and also open-ended questions.

The qualitative data were coded according to Bolman and Deal's criteria for coding frame responses, as given in Appendix E, Table 4.4. The worksheet that was used to code the specified approaches and open-ended responses was completed. Data that directly corresponded to the Bolman and Deal categories were coded as structural, human resource, political, or symbolic approach. Data that did not reflect the categories were coded as a general category or other approach. The general category was then broken down into subcategories in terms of themes and patterns, and coded using qualitative data analysis (Dalziel 2007, 47). The response categories for an "other" approach were coded, grouped, and reclassified based on the details of the approaches that each respondent specified.

The approach-related issues and actions for the corresponding "other" approach were presented in the corresponding cases. Similar words, phrases, and expressions of all the respondents' responses to open-ended questions were counted in terms of themes and

patterns. At the same time, the thematic highlights of the related comments were presented in other tables.

This study strived to gain insight into library directors' attitudes, behaviors, and approaches to managing change in different types of academic libraries. The results of regression analysis displayed what factors influenced the directors' "other" approaches to managing change, which is a significant part of this study. The results of this study will help directors plan, implement, and manage change in the future by enabling them to reflect on management options, weigh the influence of each variable, and better understand the factors that explain the "other" approaches to managing change.

CHAPTER V

FINDINGS AND DISCUSSION

The large-scale survey was conducted using the SurveyMonkey system. Of the 596 surveys returned, 455 directors successfully completed the survey. Their results are presented here and in Chapter VI, Findings and Discussion (Continued). The study excluded 130 incomplete surveys and 11 surveys from respondents who did not hold the job title of directorship, or deanship, or equivalent.

This chapter reports and discusses respondents' (1) personal and organizational information, (2) experience with change management, and (3) written comments.

Personal and Organizational Information

The personal and organizational information of the 455 large-scale study respondents are given in Table 5.1. Respondents had a near-equal representation of gender. While the age range varied from 25 to >65 years, 254/455 (55.8%) respondents were between the ages of 55 and 64 years. The majority of respondents had an MLS degree, and 69 (15.2%) had a combined MLS plus PhD (Table 5.1).

Most of the respondents (322, 70.8%) were directors or held a comparable title at their respective academic libraries. The respondents had a mean of 26.6 years of library service (Table 5.2).

The respondents had supervised a mean of 36.7 subordinates. However, the standard deviation was much larger than the mean because the data for respondents' number of subordinates were highly skewed. The result displayed that 128 (28.1%) supervised one to nine subordinates, whereas 139 (30.5%) thirty or more. The maximum number was 600. Table 5.17 (Part 2) in Appendix F details the correlation matrix for the personal and organizational variables used in this study's analysis.

Table 5.1: Large-scale Survey Results of Academic Library Directors' Personal Information (N = 455)

Personal Information	No. of Responses (%)
Male	201 (44.2)
Female	254 (55.8)
Age (Years)	
25–29	2 (0.4)
30–34	6 (1.3)
35–39	18 (4.0)
40–44	19 (4.2)
45–49	37 (8.1)
50–54	83 (18.2)
55–59	144 (31.6)
60–64	110 (24.2)
>65	36 (7.9)
Education Level	
Other	3 (0.7)
MA/MS not in Library Science	15 (3.3)
MLS	177 (38.9)
MLS plus other master's degree	161 (35.4)
PhD	30 (6.6)
MLS plus PhD	69 (15.2)

Legend: NO = Number, SD = Standard deviation

Table 5.2: Large-scale Survey Results of Academic Library Directors' Organizational Information (N = 455)

Organizational Information	No. of Responses (%)	Mean (SD)
Position Title		
College Librarian	4 (0.9)	
Dean	102 (22.4)	
Director	322 (70.8)	
University Librarian	27 (5.9)	
Work Service		
Years at Present Position		8.7 (7.9)
Years of Library Service		26.6 (9.8)
Number of Different Professional Library Positions		4.8 (2.7)
Number of Subordinates		36.7 (61.4)
Number of Library Branches		1.6 (3.4)
Type of Institution		
Baccalaureate-granting	113 (24.8)	
Master-granting	185 (40.7)	
Doctoral-granting	157 (34.5)	
Total Student Enrollment		
<10,000	329 (72.3)	
10,000–19,999	65 (14.3)	
20,000–29,999	32 (7.0)	
30,000 or more	29 (6.4)	

Legend: No. = Number, SD = Standard deviation

Types of Change Managed

Question 1. Which of the following types of change have you managed?

Respondents were offered a choice of the following five types of change (Table 5.3) and asked to determine which type(s) they managed:

- Planned change (proactive or incremental change)—occurs when distinct changes take place over time and then move to a specific outcome (Stueart and Moran 2002, 14-15)
- Unplanned change (reactive change)—takes place amidst uncontrolled pressures for change or a mismanaged process (Stueart and Moran 2002, 14-15).
- Other—Write in another type of change
- Both planned and unplanned change
- Multiple types of change—Managing a combination of planned, unplanned, or other

Most of respondents (362, 79.6%) stated that they managed both planned and unplanned change. Eighty-six respondents (18.9%) only managed planned change, while only six respondents managed unplanned change. None of the respondents managed the multiple types of change.

Thirteen respondents checked "other," although none of their comments actually reflected a true "other" category. Eight of these respondents also said they managed both planned and unplanned change. Several noted that change and planning change are often out of their control. The remaining five respondents merely commented on changes they

had experienced such as managing change in automation and a new building, changing the library into a learning organization, and adding a library building.

One respondent stated that it is "impossible to classify all the different sorts of change that occur in a complex organization." Another respondent added, "There is an overall plan, but given the size of the institution and the financial constraints, it may not be followed in detail. The financial VP can kill a plan faster than anyone, as can an unforeseen need elsewhere on campus."

Table 5.3: Types of Change Managed

Types of Change	No. of Responses (%)
Planned	86 (18.9)
Unplanned	6 (1.3)
Other	0 (0)
Both planned and unplanned	362 (79.6)
Multiple types	0 (0)

Legend: No. = Number

Approaches Used to Manage Change

Question 2. Which of the following approaches have you used to manage change?

Based on Bolman and Deal's model, respondents were offered a choice of five different approaches that were used to manage change. They were asked to identify the

approaches that they used, including any not listed; choose an example for that approach, if applicable; and determine how often they used this approach(es) (Table 5.4).

Forty-four respondents checked "other." However, 41 of the respondents described approaches that are classified as one of Bolman and Deal's approaches. They most often described human resource and structural approaches. Only three respondents noted in Table 5.4 described true "other" approaches, which involve the "in-source" approach or use of consultants and outside facilitators. A few are noted here:

- ". . .Anyone can change the organization chart, but to make lasting change, the focus must be equally upon the organizational culture. I have used all the techniques you cite, plus occasionally used outside facilitators and annually close the libraries for a one-day all-staff Retreat."

- "Surveys of staff opinions. Consultancies of various types. Established various councils and schemes. Evaluated quality for supervision and provided training for supervisors."

- "Share information, conducted research, consulted professional network and paid consultants."

Table 5.4: Large-scale Study Responses to Approaches Used to Manage Change

Approaches to Managing Change	Frequency of Approaches Used No. of Responses (%)				
	Never	Occasionally	Sometimes	Often	Always
STRUCTURAL					
▪ Realign roles, duties, relationship of staff	3 (0.7)	61 (13.4)	192 (42.2)	167 (36.7)	30 (6.6)
▪ Use many tasks or project teams	32 (7.0)	79 (17.4)	122 (26.8)	154 (33.8)	66 (14.5)
HUMAN RESOURCE					
▪ Provide training and support for people	3 (0.7)	18 (4.0)	56 (12.3)	199 (43.7)	179 (39.3)
▪ Promote staff participation and involvement	2 (0.4)	9 (2.0)	37 (8.1)	181 (39.8)	225 (49.5)
POLITICAL					
▪ Resolve conflicts, negotiate compromises, help form coalitions	5 (1.1)	31 (6.8)	107 (23.5)	196 (43.1)	113 (24.8)
▪ Communicate with top-level management	1 (0.2)	11 (2.4)	34 (7.5)	142 (31.2)	263 (57.8)
SYMBOLIC					
▪ Tell stories, share many special events, use a variety of rituals	26 (5.7)	111 (24.4)	138 (30.3)	129 (28.4)	49 (10.8)
▪ Hold celebrations of significant milestones	1 (0.2)	11 (2.4)	34 (7.5)	142 (31.2)	263 (57.8)
OTHER	0	1	0	2	0
▪ Any other approach used	(0)	(0.2)	(0)	(0.4)	(0)

Legend: No. = Number of responses

Approaches Used to Manage Change in Different Library Areas

Question 3. What approaches listed in Question 2 have you used to manage change in the following areas?

Because Bolman and Deal's approaches may be viewed in different ways, two examples were given for each approach (excluding "other"). The respondents were asked to note what approaches they used in different library situations (Table 5.5). The directors

were encouraged to choose all applicable examples and approaches. Thus a director could choose either one or both examples of any applicable approach.

Table 5.5: Approaches Used to Manage Change in Different Library Areas

Approaches to Managing Change and Examples for Each Approach	Frequency of Examples Used, as Applied to Different Library Areas No. of Responses (%)				
	Information Technology	Library Funding	Library Personnel	Public Relations	*Other Areas
STRUCTURAL					
▪ Realign roles, duties, relationship of staff	321 (70.5)	147 (32.3)	334 (73.4)	151 (33.2)	39 (8.6)
▪ Use many tasks or project teams	253 (55.6)	110 (24.2)	189 (41.5)	159 (34.9)	47 (10.3)
**Total Responses	574 (63.1)	257 (28.2)	523 (57.5)	310 (34.1)	86 (9.5)
HUMAN RESOURCE					
▪ Provide training and support for people	355 (78)	127 (27.9)	318 (69.9)	139 (30.5)	40 (8.8)
▪ Promote staff participation and involvement	314 (69)	190 (41.8)	289 (63.5)	250 (54.9)	55 (12.1)
**Total Responses	669 (73.5)	317 (34.8)	607 (66.7)	389 (42.7)	95 (10.4)
POLITICAL					
▪ Resolve conflicts, negotiate compromises, help form coalitions	216 (47.5)	129 (28.4)	300 (65.9)	117 (25.7)	43 (9.5)
▪ Communicate with top-level management	286 (62.9)	296 (65.1)	270 (59.3)	231 (50.8)	50 (11.0)
**Total Responses	502 (55.2)	425 (46.7)	570 (62.6)	348 (38.2)	93 (10.2)
SYMBOLIC					
▪ Tell stories, share many special events, use a variety of rituals	119 (26.2)	104 (22.9)	213 (46.8)	164 (36.0)	39 (8.6)
▪ Hold celebrations of significant milestones	170 (37.4)	89 (19.6)	177 (38.9)	154 (33.8)	38 (8.4)
**Total Responses	289 (31.8)	193 (21.2)	390 (42.9)	318 (34.9)	77 (8.5)
OTHER					
▪ Use a completely different approach	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)

Legend: No. = Number
*Each director could choose one or both examples, giving a total response of 910 for each approach.

As shown in Table 5.5, the structural approach was used most often in managing change in information technology (574 responses, 63.1%) and library personnel (523 responses, 57.5%). The human resource approach was used in all areas of the library.

Most responses were noted in information technology (669, 73.5%) and library personnel (607, 66.7%). While many approaches were used to manage change in technology, most directors turned to the human resource approach to provide needed training and support. At the same time, they encouraged staff participation and involvement in the change process. Human resource approach was used more than the other approaches in other areas of the library (95 responses, 10.4%).

The political approach was chosen frequently in the areas of information technology (502 responses, 55.2%) and library personnel (570 responses, 62.6%). The political approach was also used frequently in library funding (425 responses, 46.7%). The directors resolved conflicts and communicated with top-level management.

The symbolic approach was used most frequently in library personnel (390 responses, 42.9%). This area involves many issues such as division of work, realignments of people's roles, responsibilities, or relationships, people's training and support, and people's interests. The symbolic approach was used the second most frequently in the public relations arena (318 responses, 34.9%). This area involves a variety of activities, relationships, and communication with the public and parental institutions to enhance an academic library's image. To solve problems in these areas, directors might tell stories, use rituals, and hold more special events and celebrations.

However, 193 (21.2%) directors used the symbolic approach, such as sharing social events and rituals, when managing change in library funding.

Of the numerous directors who noted "other areas" (Table 5.5), only 30 (6.6%) commented on a specific area that required change. Most of these comments focused on library buildings and facilities, commenting on space issues and remodels and renovations.

The directors used multiple approaches when managing change far more than they used dual approaches (Table 5.6), particularly when managing change in information technology and library personnel. Dual approaches were used most often when dealing with library funding (93 responses, 20.4%). Multiple choices were used by 292 respondents (64.2%) in information technology.

The multiple approaches were used to deal with rapidly developing technology. In addition, the many perspectives of public relations, such as relationships, roles, duties, training, and special interest, were also handled from multiple perspectives (209 responses, 45.9%). Directors managed change in library personnel from multiple perspectives because of the many issues involved including division of work; realignment of people's roles, responsibilities, or relationships; training and support; and varied staff interests.

Table 5.6: Directors' Use of Dual and Multiple Approaches to Managing Change in Different Library Areas

Dual & Multiple Approaches Used to Manage Change (as Chosen by Respondents)	Frequency of Approaches Used to Manage Change in Different Library Areas No. of Responses (%)				
	Information Technology	Library Funding	Library Personnel	Public Relations	Other Areas
DUAL APPROACHES					
▪ Structural and human resource	35 (7.7)	13 (2.9)	9 (2.0)	14 (3.1)	0 (0)
▪ Structural and political	9 (2.0)	16 (3.5)	7 (1.5)	9 (2.0)	3 (0.7)
▪ Structural and symbolic	2 (0.4)	3 (0.7)	3 (0.7)	6 (1.3)	0 (0)
▪ Structural and other	0 (0)	0 (0)	0 (0)	2 (0.4)	0 (0)
▪ Human resource and political	16 (3.5)	35 (7.7)	9 (2.0)	30 (6.6)	0 (0)
▪ Human resource and symbolic	7 (1.5)	5 (1.1)	2 (0.4)	16 (3.5)	3 (0.7)
▪ Political and symbolic	0 (0)	21 (4.6)	0 (0)	15 (3.3)	0 (0)
Total Responses	69 (15.2)	93 (20.4)	30 (6.6)	92 (20.2)	6 (1.3)
MULTIPLE APPROACHES					
▪ Structural, human resource, and political	94 (20.7)	59 (13)	81 (17.8)	34 (7.5)	9 (2.0)
▪ Structural, human resource, and symbolic	8 (1.8)	8 (1.8)	6 (1.3)	25 (5.5)	4 (0.9)
▪ Structural, political, and symbolic	1 (0.2)	3 (0.7)	1 (0.2)	10 (2.2)	1 (0.2)
▪ Human resource, political, and symbolic	6 (1.3)	28 (6.2)	7 (1.5)	36 (7.9)	2 (0.4)
▪ Human resource, political, and other	0 (0)	0 (0)	1 (0.2)	0 (0)	0 (0)
▪ Structural, human resource, political, and symbolic	178 (39.1)	69 (15.2)	220 (48.4)	103 (22.6)	35 (7.7)
▪ Structural, human resource, political, and other	5 (1.1)	7 (1.5)	0 (0)	1 (0.2)	0 (0)
Total Responses	292 (64.2)	174 (38.2)	316 (69.5)	209 (45.9)	51 (11.2)

Legend: No. = Number

Methods Used to Assess the Effectiveness of Change Management

Question 4. How do you assess the effectiveness of change management?

Directors assess the effectiveness of change management using numerous dual and multiple methods. Table 5.7 lists single methods used, while Tables 5.8 and 5.9 (Parts 1 and 2) detail the respondents' mixed choices under dual and multiple methods, respectively. As noted in Table 5.7, 152 (33.4%) respondents used a single method, mostly visiting all departments, to assess the effectiveness of change management.

Table 5.7: Single Methods Used to Assess the Effectiveness of Change Management

Single Methods Used	No. of Responses (%)*
▪ Establish an evaluation committee	16 (3.5)
▪ Conduct an assessment survey	18 (4.0)
▪ Visit all departments	55 (12.1)
▪ Review all documents and interview users	14 (3.1)
▪ Other (none of the above-mentioned four methods)	49 (10.8)

Legend: No. = Number
*Percentages based on 455 total respondents.
Each director noted all methods used to evaluate change.

Of the 168 (36.9%) respondents who checked "other", 81 did not write comments about the alternative methods they used, while 87 (19.1%) respondents commented on how to assess the effectiveness of change management. Each comment was analyzed based on the above-mentioned methods. Of these respondents, 5 did not mention a

method. Only 45 respondents appear to use a method that is different from these methods: (1) establishing an evaluation committee; (2) conducting an assessment survey; (3) visiting all departments; and (4) reviewing all documents and interviewing users. Most respondents work in larger academic libraries, with a large staff, and are more likely to conduct a formal assessment of change. One respondent commented, "Frankly these choice options seem heavily weighted toward larger institutions." Methods that the directors used varied from talking to personnel, conducting surveys, reviewing data and statistics, and employing consultants. Two respondents claimed that they did not assess change.

One respondent commented, "Formal assessment is a part of change management; however, there are instances in which change is required regardless of whether it is or is not successful."

A total of 160 (35.2%) directors used the dual methods listed in Table 5.8 to assess change management. Visiting all departments was chosen by 73/455 (16%) respondents, while only 5/455 (1.1%) respondents would review all documents and interview users along with taking an "other" approach.

Multiple approaches were used by 143 (31.4%) directors. Those who use multiple methods may assess change both quantitatively (survey) and qualitatively (interview, observation, and reviewing documents).

Establishing a committee was the prime method driving multiple assessment of change management. Out of 143 respondents choosing a multiple evaluation method, 63

(44.1%) would establish a committee to help evaluate change management in addition to a variety of other methods used (Table 5.9 Parts 1 and 2).

Table 5.8: Dual Methods Used to Assess the Effectiveness of Change Management

Dual Methods Used	No. of Responses (%)
Establish a committee AND one of the following:	
▪ Conduct a survey	8 (1.8)
▪ Visit all departments	8 (1.8)
▪ Review all documents and interview users	6 (1.3)
Conduct a survey AND one of the following:	
▪ Visit all departments	30 (6.6)
▪ Review all documents and interview users	16 (3.5)
▪ Other	14 (3.1)
Visit all departments AND one of the following:	
▪ Review all the documents and interview users	55 (12.1)
▪ Other	18 (4.0)
Review all documents and interview users AND	
▪ Other	5 (1.1)
*Total responses	160 (35.2)

Legend: No. = Number
*Percentages based on 455 respondents.

Table 5.9 (Part 1): Multiple Methods Used to Assess the Effectiveness of Change Management

Multiple Methods Used	No. of Responses (%)
Establish a committee AND	
▪ Conduct a survey ▪ Visit all departments ▪ Review all documents and interview users ▪ Other	5 (1.1)
▪ Conduct a survey ▪ Visit all departments ▪ Review all documents and interview users	37 (8.1)
▪ Conduct a survey ▪ Visit all departments	2 (0.4)
▪ Conduct a survey ▪ Review all documents	5 (1.1)
▪ Conduct a survey ▪ Review all documents and interview users ▪ Other	1 (0.2)
▪ Visit all departments ▪ Review all documents and interview users	9 (2.0)
▪ Visit all departments ▪ Other	2 (0.4)
▪ Review all documents and interview users ▪ Other	2 (0.4)

Legend: No. = Number
*Out of 455 respondents.

Table 5.9 (Part 2): Multiple Methods Used to Assess the Effectiveness of Change Management

Multiple Methods Used	No. of Responses (%)
Conduct a survey AND	
▪ Visit all departments ▪ Review all documents and interview users ▪ Other	5 (1.1)
▪ Visit all departments ▪ Review all documents and interview users	50 (11.1)
▪ Review all documents and interview users ▪ Other	5 (1.1)
▪ Visit all departments ▪ Other	12 (2.6)
Visit all departments AND	
▪ Review all departments and interview users ▪ Other	8 (1.8)
*Total responses	143 (31.4)

Legend: No. = Number
*Out of 455 respondents.

Reactions to Statements on Institutional Environments

Question 5. How strongly do you agree or disagree with the following statements on institutional environments?

Table 5.10 lists the directors' reactions to two statements on institutional environments. The results demonstrate that the directors feel supported regarding change in the academic library setting. However, funding doesn't receive quite the same support. According to Gold (2005, 189-190), "some academic libraries are chronically under

funded. Many academic librarians are, or feel, underpaid."

Gold cites several reasons including the fact that most academic library economies are "tied to the financial status of their parent institutions. These in turn are tied to the performance of investment portfolios, the economy, and the solvency of the state or local government they serve." Fixed costs of running a facility and the enormous cost of library collections tend to take precedence over the staff payroll (Gold 2005, 189).

Table 5.10: Reactions to Statements on Institutional Environments

Statement	Statement Reactions Frequency (%)				
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
University vice presidents or provosts like and support library change	7 (1.5)	26 (5.7)	88 (19.3)	240 (52.7)	94 (20.7)
There are adequate university funds for library change in resources and services	73 (16.0)	158 (34.7)	113 (24.8)	97 (21.3)	14 (3.1)

Of course, funding is a problem in other types of libraries as well. According to Evans, Ward, and Rugaas (2000, 470), "Today, few libraries can expect to receive all the funds from their parent institutions that they need to operate the way they would like." Fund raising becomes a necessity for many institutions.

Time and Effort Spent on Various Roles in Managing Change

Question 6. How much time and effort do you spend in managing the following?

Table 5.11 lists the amount of time and effort that directors spent managing change. Respondents' roles in managing change (Moskowitz 1986) are varied. Among all the roles, 83 (18.2%) directors spent most of their time and efforts in analyzing

and introducing the library's need for change. Not surprisingly, current academic libraries are caught up in the mode of rapidly changing technology. As a result, patrons expect prompt and responsive service. These challenges require directors to analyze and identify both internal and external requirements for change.

Change is constant in library resources and services, as indicated by the fact that 228 (50.1%) directors noted that much of their time and effort was spent on managing change in resources, services, and administration. This was necessary to meet patrons' needs. Only 29 (6.4%) respondents noted "other," and 14 made comments. Half of these respondents replied that they spend time looking for donors. Noteworthy comments include the following:

- "Many of our documented needs are moot due to lack of institutional priority for the library, lack of capital resources, lack of success in negotiating change, and a boss who agrees with me that we will both be retired (10 years from now) before any significance (sic) capital improvements are made in the library. The message to me is keep up the good work by maintaining the status quo of your operation."

- "I find change management both necessary and exciting. I have led one profession-wide change effort in my career and am instigating another, although less formally than the first."

Table 5.11: Time and Effort Spent on Various Roles in Managing Change

Directors' Roles in Managing Change	Amount of Time and Effort Spent No. of Responses (%)				
	Least	Little	Moderate	Much	Most
Managing changes in resources, services, and administration	0 (0)	20 (4.4)	137 (30.1)	228 (50.1)	70 (15.4)
Creating a clear long-range vision and direction for change projects	6 (1.3)	48 (10.5)	181 (39.8)	157 (34.5)	63 (13.8)
Presenting and explaining the needs of library changes to university administrators and faculty	4 (0.9)	55 (12.1)	191 (42.0)	163 (35.8)	42 (9.2)
Maintaining contacts with university administrators and faculty concerning change projects	6 (1.3)	52 (11.4)	177 (38.9)	183 (40.2)	37 (8.1)
Obtaining information on change projects through professional associations and activities	15 (3.3)	86 (18.9)	231 (50.8)	110 (24.2)	13 (2.9)
Informing outsiders of the progress of change projects	38 (8.4)	159 (34.9)	198 (43.5)	54 (11.9)	6 (1.3)
Negotiating with parent institutions to ensure funding of change projects	60 (13.2)	89 (19.6)	175 (38.5)	105 (23.1)	26 (5.7)
Supervising subordinates' work during the change process	12 (2.6)	80 (17.6)	206 (45.3)	136 (29.9)	21 (4.6)
Sharing and distributing information on change projects through meetings and personal contacts	4 (0.9)	25 (5.5)	147 (32.3)	211 (46.4)	68 (14.9)
Analyzing and introducing the library's need for change	4 (0.9)	18 (4.0)	143 (31.4)	207 (45.5)	83 (18.2)
Dealing with conflicts during the change process	10 (2.2)	100 (22.0)	182 (40.0)	127 (27.9)	36 (7.9)
Allocating and coordinating resources for specific change tasks	12 (2.6)	37 (8.1)	189 (41.5)	181 (39.8)	36 (7.9)
Other	3 (0.7)	1 (0.2)	6 (1.3)	9 (2.0)	10 (2.2)

Legend: No. = Number

Changes Experienced by Academic Library Directors

Question 7. What changes has your library experienced since you became a director?

Changes that were experienced by the respondents are categorized in Table 5.12. The largest areas of change were noted in development of staff's new skills (440, 96.7%), upgrading technologies and facilities (435, 95.6%), budget adjustments (420, 92.3%), and policies (433, 95.2%). Only 150 (33%) directors experienced downsizing.

Of the 75 (16.5%) respondents who checked "other," 68 (14.9%) commented on changes. Changes experienced varied from facility renovations to empowering staff, adding new services such as laptop circulation and IT projects, and providing online learning and classes.

Table 5.12: Changes Experienced by Academic Library Directors

Changes	Changes Experienced No. of Responses (%)	
	Yes	No
Development of staff's new skills	440 (96.7)	12 (2.6)
Decentralization of power in library administration	234 (51.4)	210 (46.2)
Reorganization of specific units such as reference, cataloging, and acquisition	377 (82.9)	72 (15.8)
Downsizing	150 (33.0)	298 (65.5)
Upgrading technologies and facilities	435 (95.6)	19 (4.2)
Budget adjustments	420 (92.3)	30 (6.6)
Policies	433 (95.2)	18 (4.0)
Other	75 (16.5)	14 (3.1)

Legend: No. = Number

Library Areas that May Experience Change

Question 8. Which of the following potential changes apply to your library?

By far, the majority of directors feel that change applies to various aspects of their library, and 97.1% of directors agree that changes could occur in information technology (Table 5.13). Twenty-one respondents (4.6%) checked "other" and specified potential changes that apply to their libraries. One respondent commented: "Everything is in a state of constant change, and that is good." Another respondent apparently was hoping for change: "Stagnant budget, Minimal staffing, lack of administrative support. We are seeing the rise of anti-intellectual approach to learning. Service learning is celebrated but

is nothing but picking up people trash or dishing out hash to the homeless. The students then write a paper telling how this made them feel all warm and fuzzy. Research projects are few and far between but sports are doing very well here."

Table 5.13: Library Areas that May Experience Change

Library Areas	Possibility of Change No. of Responses (%)	
	Yes	No
Information technology	442 (97.1)	12 (2.6)
Technical services	396 (87.0)	54 (11.9)
Library resources	426 (93.6)	27 (5.9)
Public services	407 (89.5)	44 (9.7)
Library collections	432 (94.9)	20 (4.4)
Library personnel	421 (92.5)	29 (6.4)
Library facilities	387 (85.1)	65 (14.3)
Budgeting	398 (87.5)	50 (11.0)
Policies	401 (88.1)	43 (9.5)
Other	21 (4.6)	14 (3.1)

Legend: No. = Number

Approaches to Managing Change in Information Technology

Question 9. How do you manage change in information technology?

Descriptive Results

Most (44%) directors used the multiple approaches to managing change in information technology, while 39.1% used the dual approaches (Table 5.14). The total single approaches were only used by 16.9% of all respondents. No respondent used single political, symbolic or other approach to managing change in information technology. No respondent checked N/A (not applicable) for each response.

The structural and human resource approaches were favored by directors choosing dual or multiple approaches. Most likely, these approaches appear together more often over the others because directors spend much of their time working with a variety of people and realigning roles and duties of staff in current academic libraries that are caught up in the mode of rapidly changing technology.

The "other" approach was noted by 9.9% respondents. Of these respondents, 21 commented on the "other" approach they used. However, only four of the 21 respondents listed a true "other" approach rather than one of Bolman and Deal's approaches. Other approaches included outsourcing of technology work, webpage design and maintenance, and the use of consultants to analyze staff skills. According to the Bolman and Deal's criteria for coding the open-ended frame responses cited in Appendix E, nine responses were actually the structural approach; seven, human resource; and one, political. The remaining 24 respondents made no comments and therefore could not be ruled out as not

actually using "other" approaches. Consequently, 28 respondents are included in the "other approach" category in Table 5.14.

The free comments on the "other" approach respondents used demonstrate that directors used structural and human resource approaches more than other approaches. They mainly reorganized services and resources, set change goals and schedules, increased the size of staff, coordinated with other entities, and realigned job descriptions. At the same time, they managed change through communication and collaboration, and by supporting and empowering the staff. They did not mention any symbolic approach used.

Dependent Variables

Table 5.14 shows descriptive statistical results of the dependent variables used in the analysis. The dependent variable is the directors' approaches to managing change in information technology. It has three main categories: (1) single approaches; (2) dual approaches; and (3) multiple approaches. The single approaches have three subcategories: (1) structural; (2) human resource; and (3) political.

Table 5.14: Approaches Used in Response to Question 9: How Do You Manage Change in Information Technology? (N = 455)

Approaches Used	No. of Responses	(%)
SINGLE APPROACHES		
STRUCTURAL	11	(2.4)
▪ Manage change through downsizing		
HUMAN RESOURCE	62	(13.6)
▪ Manage change by developing employees' new skills		
POLITICAL	4	(0.9)
▪ Manage change through the decentralization of power		
SYMBOLIC	0	(0)
▪ Manage change by redefining the meaning of work in high-technology environments		
OTHER	0	(0)
▪ Use a completely different approach		
Total Responses	77	(16.9)
DUAL APPROACHES		
▪ Structural and human resource	5	(1.1)
▪ Human resource and political	46	(10.1)
▪ Human resource and symbolic	119	(26.2)
▪ Human resource and other	7	(1.5)
▪ Political and symbolic	1	(0.2)
Total Responses	178	(39.1)
MULTIPLE APPROACHES		
▪ Structural, human resource, political, and symbolic	14	(3.1)
▪ Structural, human resource, and political	4	(0.9)
▪ Structural, human resource, and symbolic	11	(2.4)
▪ Human resource, political, and other	2	(0.4)
▪ Human resource, political, and symbolic	150	(33.0)
▪ Human resource, political, symbolic, and other	15	(3.3)
▪ Human resource, symbolic, and other	4	(0.9)
Total Responses	200	(44.0)

Legend: No. = Number

Independent Variables

Independent variable statistics are noted in Table 5.15. Gender is a nominal variable. Age, education level, library size, and the number of subordinates are ordinal

variables. Library type is a nominal variable with three categories. The other statistics (years of work, number of different positions, etc.) are continuous variables.

Age had nine categories (25–29 years, 30–34 years, and on up to > 65 years). Six educational levels were noted, ranging from bachelors degree to doctorate. Choices of library type were based on the Carnegie classifications, and the library size coincided with student enrollment. The high correlation between the number of subordinates and the number of library branches (r = .716) may indicate a potential multicollinearity problem. Therefore, the original continuous variable of the number of subordinates was recoded to four categories.

Table 5.15: Descriptive Statistics of Independent Variables Used in the Analysis (N = 455)

Variables	Percent/Mean	SD
Male	44.2%	---
Age (9-point scale)	7.0[a]	8.0[b]
Education level (6-point scale)	4.0[a]	5.0[b]
Years of present position	8.7	7.9
Years of all directorship, or deanship (or equivalent)	12.1	9.3
Years involved in all library services	26.6	9.8
Number of different library professional positions	4.8	2.7
Number of subordinates	2.0[a]	3.0[b]
Number of library branches	1.6	3.4
Library type (3-point scale)	2.0[a]	2.0[b]
Library size (4-point scale)	1.0[a]	3.0[b]

Legend: SD = Standard deviation
[a] Median, [b] Range

Results of Bivariate Crosstabulation and χ^2 Test

The bivariate cross-tabulation indicated that there were many significant associations between the independent variables and the directors' approaches to managing change in information technology (Table 5.16). The chi-square test was used to check whether two nominal variables are independent from or related to each other (Sarantakos 2005, 385). The collected continuous variables were recoded as the categorical ones. The ordinal variables with more categories were also recoded for the sake of reliable results. Results indicated that demographics, human capital, and library characteristics could be used to predict respondents' approaches to managing change in information technology.

The χ^2 test shows that there was a very significant relationship between directors' approaches and gender at the .01 level. The minimum expected count is 34.02. The result can be trusted. Females were more likely than males to use dual approaches to manage change in information technology, while males were more likely than females to use multiple approaches.

The χ^2 tests did not detect any significant relationship between directors' approaches and these variables: age and education level at the .05 level. However, the percentage results display that directors who were twenty-five to thirty-nine employed single and dual approaches more often than those with other age groups, while directors who were forty or more used multiple approaches more than those with other age groups. This supports the hypothesis that the older directors use multiple approaches more often

than the younger ones while managing change. Those who obtained MA/MS not in library science and other used the single approach more often, while those who got MLS plus other master's degree used dual approaches more often. Those who had a PhD used multiple approaches more often than those with other education levels.

The χ^2 test shows that there was a very significant relationship between directors' approaches and library type at the .05 level. The minimum expected count is 19.12. The result can be trusted. Those who worked for a doctoral-granting college or university were more likely to use multiple approaches, while those who worked for a baccalaureate-granting college or university were more likely to use single and dual approaches. This supports the hypothesis that directors who work for a higher academic degree college or university are more likely to use the multi-frame approach than their counterparts.

The χ^2 test detected a significant relationship between directors' approaches and library size at the .05 level. The minimum expected count is 10.32. The result can be trusted. Those who worked for a college or university with less than 10,000 total student enrollment were more likely to use single and dual approaches, while those who worked for a college or university with 10,000 to 19,000 student enrollment were more likely to use multiple approaches.

In Table 5.16 (continued) below, the χ^2 tests show that there were no significant relationships between directors' approaches and these variables: years of present position, years of all directorship, and number of library branches at the .10 level. However, the

percentage results demonstrate that directors who had been in their current positions for fewer than one year to four years slightly used dual approaches more, while those for five to nine years slightly used multiple approaches more. Those who had been in directorship for fewer than one to four years used the multi-frame approach more. Those who oversaw two or more library branches used the multi-frame approach more.

According to the result of the χ^2 test, there was a significant relationship between directors' approaches and total years of library service at the .05 level. The minimum expected count is 9.48. The result can be trusted. Directors who served in libraries for thirty or more years were slightly more likely to use multiple approaches, while those for fewer than one year to fourteen years were more likely to use single and dual approaches.

The result of the χ^2 test displays that there was a significant relationship between directors' approaches and number of different positions at the .05 level. The minimum expected count is 16.08. The result can be trusted. Those who held seven or more different positions were more likely to use the multi-frame approach, while those who held one to three different positions were likely to use single approaches. Those who held four to six different positions were slightly more likely to use dual approaches.

The χ^2 test detected a very significant relationship between directors' approaches and number of subordinates at the .001 level. The minimum expected count is 11.0. The result can be trusted. Directors who oversaw thirty or more subordinates were more likely to use the multi-frame approach, while those who oversaw ten to nineteen subordinates

were slightly more likely to use dual approaches. Those who oversaw one to nine subordinates were more likely to use single approaches.

Table 5.16. Percentage Distribution of Directors' Attitudes toward Approaches Used to Manage Change in Information Technology (N = 455)

	Approaches Used (%)				
	Single	Dual	Multiple	Total	No.
Gender					
Female	16.5	45.3	38.2	100.0	(254)
Male	17.4	31.3	51.2	100.0	(201)
χ^2 = 9.969, df = 2, p = .007					
Age					
25–39	19.2	57.7	23.1	100.0	(26)
40-59	17.0	37.8	45.2	100.0	(283)
60- >65	16.4	38.4	45.2	100.0	(146)
χ^2 = 5.276, df = 4, p = .260					
Education Level					
MA/MS not in Library Science & Other	22.2	33.3	44.4	100.0	(18)
MLS	18.6	39.0	42.4	100.0	(177)
MLS plus other master's degree	17.4	44.1	38.5	100.0	(161)
PhD	12.1	32.3	55.6	100.0	(99)
χ^2 = 8.541, df = 6, p = .201					
Type of Institution					
Baccalaureate-granting	24.8	42.5	32.7	100.0	(113)
Master-granting	15.1	39.5	45.4	100.0	(185)
Doctoral-granting	13.4	36.3	50.3	100.0	(157)
χ^2 = 11.053, df = 4, p = .026					
Total Student Enrollment					
<10,000	19.8	40.4	39.8	100.0	(329)
10,000–19,999	10.8	33.8	55.4	100.0	(65)
20,000 or more	8.2	37.7	54.1	100.0	(61)
χ^2 = 11.038, df = 4, p = .026					
Total	16.9	39.1	44.0	100.0	
No.	(77)	(178)	(200)	(455)	

Legend: No. = Number

Table 5.16 (continued)

	Approaches Used (%) Single	Dual	Multiple	Total	No.
Years of Present Position					
0 - 4	15.6	40.1	44.3	100.0	(167)
5 - 9	16.7	38.2	45.1	100.0	(144)
10 or more	18.8	38.9	42.4	100.0	(144)
χ^2 = 681, df = 4, p = .954					
Years of All Directorship					
0 - 4	16.7	37.0	46.3	100.0	(108)
5 - 9	18.3	39.1	42.6	100.0	(115)
10 - 14	11.4	43.0	45.6	100.0	(79)
15 or more	19.0	38.6	42.5	100.0	(153)
χ^2 = 2.673, df = 6, p = .849					
Years of Library Services					
0 - 14	26.8	46.4	26.8	100.0	(56)
15 - 29	17.4	36.6	45.9	100.0	(172)
30 or more	14.1	39.2	46.7	100.0	(227)
χ^2 = 9.652, df = 4, p = .047					
Number of Different Positions					
0 - 3	24.2	35.9	39.9	100.0	(153)
4 - 6	15.0	41.5	43.5	100.0	(207)
7 or more	9.5	38.9	51.6	100.0	(95)
χ^2 = 10.898, df = 4, p = .028					
Number of Subordinates					
1 - 9	25.0	39.8	35.2	100.0	(128)
10 - 19	20.3	42.3	37.4	100.0	(123)
20 - 29	15.4	38.5	46.2	100.0	(65)
30 or more	7.2	36.0	56.8	100.0	(139)
χ^2 = 23.105, df = 6, p = .001					
Number of Library Branches					
0	17.7	42.1	40.2	100.0	(164)
1	20.4	38.3	41.3	100.0	(167)
2 or more	11.3	36.3	52.4	100.0	(124)
χ^2 = 6.992, df = 4, p = .136					
Total	16.9	39.1	44.0	100.0	
No.	(77)	(178)	(200)	(455)	

Legend: No. = Number

Results of Correlations

In Table 5.17 Parts 1 – 2 (see Appendix F), bivariate correlations show that there are many significant correlations between the independent variables and the directors' approaches to managing change in information technology.

Correlations between Independent Variables and Dependent Variables

The results of this study concurred with a number of the hypotheses presented earlier regarding the use of multiple approaches (Table 5.17 Part 1). In this study, correlations between the following variables and the use of multiple approaches were detected to be positive and significant:

- Male
- Age
- Education level
- Total years of library service
- Number of different positions
- Number of subordinates
- Library type, or library size

The above-mentioned predictors except for the first two ones and weak correlations were also noted for directors who used both dual and multiple approaches. Directors who had higher education levels, served in libraries for longer periods of time, held more different positions, oversaw more subordinates, or worked at a large school or library, or at universities with higher enrollment were more likely to use multiple approaches or dual

and multiple approaches to manage change in information technology than their counterparts.

The correlation results contradicted the hypothesis that females would be more likely than males to use the multi-frame approach. There was a very significant relationship between males and the use of multiple approaches when managing change. This study agreed with many of the hypotheses. However, the study results did not coincide with the hypothesis that directors who held their current positions for longer periods of time would choose multiple approaches.

There were many significant correlations between the independent variables and the approaches chosen to manage change (Table 5.17 Part 1). The structural approach was more likely to be used by directors overseeing more library branches. The human resource approach was more likely to be used by directors who had been in their current positions for a longer period of time. However, negative correlations were noted for directors who had higher education levels, more library service, and more subordinates in addition to working at a large school or library. The political approach was used most often by directors who worked at universities with higher enrollment. None of the respondents used the symbolic approach as a single approach.

Single approaches were more likely to be used by directors who had been in their current positions for longer periods of time. Male directors were less likely to use the dual approach than their counterparts.

The above-discussed correlations between predictors and dependent variables were significant. However, they were very weak and low because their calculated r values were below .30. The calculated r values did not illustrate moderate correlations (.40 to .70) and strong correlations (.70 or more).

Correlations among Independent Variables

The correlations among independent variables are also given in Table 5.17 (Part 2) (see Appendix F). The final correlation between number of subordinates and number of branches was not detected to be high, indicating no multicollinearity problem. The other variables did not have a high degree of collinearity. The correlations ranged from -.008 to .517. These three categories of predictors—demographics, human capital, and library characteristics—could be used to predict respondents' approaches to managing change in information technology.

Results of Multinomial and Binary Logistic Regressions

The hypotheses of this study focus on directors' use of multiple approaches versus single approaches. Thus, "single approaches" is used as the reference category. Table 5.18 lists the multinomial logistic regression estimates that predict directors' approaches to managing change in information technology. The estimated pseudo R^2 displays that this set of variables/subscales explains 13.3% of the variation in the directors' approaches to managing change in information technology. The results show that independent variables—age, number of subordinates, and years of all library service—significantly impact the outcome variables.

There was a negative and significant relationship between age and single approaches versus dual approaches. This implies that each additional level in age decreases the likelihood by 18.0% (.820 -- 1 = -.18) in using dual approaches rather than single approaches. Older directors were less likely to use dual approaches than younger directors.

There was a significant and positive relationship between the number of subordinates and the use of single approaches versus dual approaches. Each additional level in the number of subordinates increases the likelihood by 36.1% (1 – 1.361 = .361) of using dual approaches rather than single approaches. This indicates that those who oversaw more subordinates were more likely to use dual approaches than those who oversaw fewer subordinates.

A very significant and positive relationship between the total years of library service and the use of single approaches versus multiple approaches was detected. Each additional year of library service increased the likelihood of using multiple approaches by 5.0% (1 -- 1.050 = .050). This indicates that those who had more years of library service were more likely to use multiple approaches than those who served in libraries for shorter periods of time. This supports the hypothesis that directors who have been in library service for longer periods of time are more likely than their counterparts to use the multi-frame approach to deal with change.

There was a significant and positive relationship between the number of subordinates and the use of single approaches versus multiple approaches. Each

additional level in the number of subordinates increases the likelihood of using multiple approaches by 56.0% (1 – 1.560 = .560). This indicates that those who oversaw more subordinates were more likely to use multiple approaches than their counterparts. This confirms the hypothesis that directors who oversee more subordinates are more likely than their counterparts to use the multi-frame approach than any other type of approach when dealing with change.

The relationship between male and the use of dual approaches was detected to be marginally significant (significance near .10). This was also true for the relationship between the total years of library service and the directors' use for dual approaches. The other variables might not have any significant impact of the directors' approaches used (significance far from .10).

Binary logistic regression was used to check whether the results would change. Table 5.19 reports binary logistic regression estimates that predict directors' approaches to managing change in information technology. The estimated pseudo R^2 indicates that this set of variables/subscales explains 10.8% of the variation in the directors' approaches to managing change in information technology. Results demonstrate that independent variables, such as total years of library service and the number of subordinates, show significant impact on the outcome variables. However, the predictor of age did not significantly influence respondents' approaches used.

Table 5.18: Multinomial Logistic Regression Estimates Predicting Approaches to Managing Change in Information Technology (N = 455)

	Dual Approaches vs. Single Approaches		Multiple Approaches vs. Single Approaches	
Predictors	*B*	exp(*B*)	*B*	exp(*B*)
Male	-.474	.623	.255	1.290
	(.298)		(.296)	
Age	-.199*	.820	-.112	.894
	(.115)		(.117)	
Education Level	.070	1.072	.160	1.173
	(.140)		(.139)	
Years of Present Position	-.025	.976	-.030	.971
	(.024)		(.024)	
Total Years of Directorship	.016	1.017	-.024	.977
	(.024)		(.024)	
Total Years of	.028	1.029	.049***	1.050
Library Service	(.020)		(.020)	
No. of Different	.071	1.073	.049	1.050
Positions	(.066)		(.067)	
No. of	.309**	1.361	.445***	1.560
Subordinates	(.145)		(.144)	
No. of Library	-.047	.954	-.046	.955
Branches	(.052)		(.051)	
Library Type	-.034	.966	.068	1.071
	(.227)		(.227)	
Library Size	.241	1.272	.255	1.291
	(.237)		(.236)	
Constant	.209		-1.449*	
	(.800)		(.825)	
-2 log likelihood		880.5		
Model χ^2		56.0		
Pseudo R^2		.133		
Df		22		
N		455		

Notes: The *B* is the logistic regression coefficient; exp (*B*) or odds ratio is the antilog of *B*; and standard errors are in parentheses.
*p < 0.10; **p < 0.05; ***p < 0.01; ****p < 0.001

Table 5.19: Binary Logistic Regression Estimates Predicting Approaches to Managing Change in Information Technology (N = 455)

	Dual & Multiple Approaches vs. Single Approaches	
Predictors	*B*	exp(*B*)
Male	-.107	.899
	(.274)	
Age	-.156	.856
	(.106)	
Education Level	.110	1.116
	(.129)	
Years of Present Position	-.027	.974
	(.022)	
Total Years of Directorship	-.004	.996
	(.022)	
Total Years of Library Service	.039**	1.039
	(.018)	
No. of Different Positions	.059	1.061
	(.062)	
No. of Subordinates	.382***	1.466
	(.136)	
No. of Library Branches	-.048	.954
	(.048)	
Library Type	.016	1.016
	(.210)	
Library Size	.254	1.290
	(.225)	
Constant	.112	1.119
	(.745)	
-2 log likelihood		383.3
Model χ^2		30.5
Pseudo R^2		.108
Df		11
N		455

Notes: The *B* is the logistic regression coefficient; exp (*B*) or odds ratio is the antilog of *B*; and standard errors are in parentheses.

*p< 0.10; **p< 0.50; ***p < 0.01; ****p < 0.001

Taking into account the independent variables used in this study, Table 5.20 reports on the multinomial logistic regression estimates that predict the directors' approaches to managing change in information technology. As a reference category, the human resource approach was used more often than any other single approach. The estimated pseudo R^2 indicates that this set of variables/subscales explains 19.2% of the variation of the directors' approaches to managing change in information technology. Results show that independent variables, such as age, the number of library branches, the number of subordinates, and the total years of library service, significantly impact the outcome variables.

Age was positively and significantly associated with the probability of using the structural approach rather than the human resource approach to manage change in information technology. Each additional level in age increased the likelihood by 98.7% that directors would use the structural approach rather than the human resource approach. Older directors were more likely to use the structural approach than younger directors. Age had no significant effect, however, on the use of the human resource approach versus political, dual, and multiple approaches.

The relationship between the number of library branches and the use of the human resource approach versus structural approach was positive and significant. Each additional number of library branches increased the likelihood by 24.9% of using the structural approach rather than human resource approach. The more library branches

directors oversaw, the more likely they were to use the structural approach while managing change in information technology than their counterparts.

A significant and positive relationship between the number of subordinates and the use of the human resource approach versus dual approaches was detected. Directors in charge of more subordinates were more likely than their counterparts to use dual approaches rather than the human resource approach to manage change in information technology. For each additional level in subordinates, this likelihood increased by 31.3%.

The relationship between the number of subordinates and the use of the human resource approach versus multiple approaches was detected to be positive and very significant. Each additional level in subordinates increased the likelihood by 50.4% in using multiple approaches. Directors in charge of more subordinates were more likely than their counterparts to use multiple approaches. This supports the hypothesis that those who oversee more subordinates are more likely than their counterparts to use multiple approaches when managing change.

There was a significant and positive relationship between the years of all library service and the use of the human resource approach versus multiple approaches. Those who had more years of all library service were more likely than their counterparts to use the multi-frame approach rather than human resource approach when managing change in information technology. For each additional year of library service, this likelihood increased 5.4%. This confirms the hypothesis that directors who have been in library

services for longer periods of time are more likely to use multiple approaches than their counterparts.

In terms of using the human resource approach versus the structural approach, library type was a marginally significant detector (significance close to .10). This was also true for the relationship between total years of present position and use of the human resource approach versus multiple approaches. However, the results of other variables did not significantly impact the directors' approaches used (significance far from .10).

Table 5.20: Multinomial Logistic Regression Estimates Predicting Approaches to Managing Change in Information Technology (N = 455)

	Structural vs. Human Resource		Political vs. Human Resource	
Predictors	*B*	exp(*B*)	*B*	exp(*B*)
Male	1.113	3.043	-.868	.420
	(.783)		(1.376)	
Age	.686**	1.987	.452	1.571
	(.342)		(.577)	
Education	.081	1.084	.228	.1.256
	(.332)		(.585)	
Years of Present Position	-.007	.993	-.220	.803
	(.057)		(.159)	
Total Years of Directorship	-.044	.957	-.045	.956
	(.060)		(.089)	
Total Years of Library Service	-.008	.993	.107	1.113
	(.043)		(.076)	
No. of Different Positions	-.103	.902	-.548	.578
	(.178)		(.383)	
No. of Subordinates	-.175	.840	-.080	.923
	(.368)		(.488)	
No. of Library Branches	.222*	1.249	.022	1.023
	(.129)		(.230)	
Library Type	.850	2.341	.404	1.497
	(.581)		(1.032)	
Library Size	-.286	.751	1.119	3.062
	(.592)		(.675)	
Constant	-7.632***		-7.657*	
	(2.673)		(4.282)	
-2 log likelihood				944.0
Model χ^2				85.8
Pseudo R^2				.192
Df				44
N				455

Notes: The *B* is the logistic regression coefficient; exp (*B*) or odds ratio is the antilog of *B*; and standard errors are in parentheses.
*p < 0.10; **p < 0.50; ***p < 0.01; ****p < 0.001.

Table 5.20 (continued)

Predictors	Dual vs. Human Resource *B*	exp(*B*)	Multiple vs. Human Resource *B*	exp(*B*)
Male	-.401	.670	.330	1.391
	(.325)		(.325)	
Age	-.106	.899	-.014	.986
	(.124)		(.126)	
Education	.084	1.087	.174	1.191
	(.153)		(.153)	
Years of Present Position	-.032	.968	-.037	.963
	(.026)		(.026)	
Total Years of Directorship	.009	1.009	-.031	.969
	(.026)		(.026)	
Total Years of Library Service	.032	1.032	.053**	1.054
	(.022)		(.023)	
No. of Different Positions	.040	1.041	.016	1.016
	(.066)		(.068)	
No. of Subordinates	.273*	1.313	.408**	1.504
	(.160)		(.160)	
No. of Library Branches	.058	1.060	.058	1.060
	(.112)		(.112)	
Library Type	.066	1.068	.174	1.191
	(.246)		(.247)	
Library Size	.338	1.403	.350	1.419
	(.297)		(.297)	
Constant	-.406		-2.092**	
	(.852)		(.883)	
-2 log likelihood				944.0
Model χ^2				85.8
Pseudo R^2				.192
Df				44
N				455

Notes: The *B* is the logistic regression coefficient; exp (*B*) or odds ratio is the antilog of *B*; and standard errors are in parentheses.
*p< 0.10; **p< 0.50; ***p< 0.01; ****p< 0.001.

Questions 10 through 17 address the directors' approaches based on two hypothetical scenarios from Curzon (2005). The responses to these questions are given in Chapter VI Findings and Discussions (Continued).

Open-Ended Survey Results of Academic Library Directors' Approaches to Change Management

Question 18. Please comment on any approach you have employed to manage change since you became a director.

Among 455 respondents in the final analysis of this study, 183 directors (40.2%) responded to this survey question. Two responses did not mention any specific approach and were excluded from this analysis. The results of the completed surveys from 181 respondents are presented as follows.

Personal and Organizational Information

The personal and organizational information of the 181 respondents who commented on any approach they had employed are given in Tables 5.21 and 5.22. More females (58%) than males (42%) responded to the survey. They represent a mean of 27.8 years of library service.

The respondents had supervised a mean of 41.2 subordinates. However, the standard deviation was much larger than the mean because the data for respondents' number of subordinates were highly skewed. The result showed that 51 (28.2%)

supervised one to nine subordinates, whereas 62 (34.3%) thirty or more. The maximum number was 600.

Table 5.21: Open-ended Survey Question's Results of Academic Library Directors' Personal Information (N = 181)

Personal Information	No. of Responses (%)
Male	76 (42.0)
Female	105 (58.0)
Age (Years)	
25-29	0 (0)
30-34	2 (1.1)
35-39	5 (2.8)
40–44	4 (2.2)
45–49	13 (7.2)
50–54	30 (16.6)
55-59	63 (34.8)
60–64	46 (25.4)
>65	18 (9.9)
Education Level	
Other	1 (0.6)
MA/MS not in Library Science	5 (2.8)
MLS	64 (35.4)
MLS plus other master's Degree	62 (34.3)
PhD	17 (9.4)
MLS plus PhD	32 (17.7)

Legend: NO = Number, SD = Standard deviation

Table 5.22: Open-ended Survey Question's Results of Academic Library Directors' Organizational Information (N = 181)

Organizational Information	No. of Responses (%)	Mean (SD)
Position Title		
College Librarian	1 (0.6)	
Dean	45 (24.9)	
Director	122 (67.4)	
University Librarian	13 (7.2)	
Work Service		
Years at Present Position		9.3 (8.3)
Years of Directorship, Deanship or Equivalent		13.1 (9.6)
Years of Library Service		27.8 (9.4)
Number of Different Professional Library Positions		5.1 (3.3)
Number of Subordinates		41.2 (69.5)
Number of Library Branches		1.7 (4.1)
Type of Institution		
Baccalaureate-granting	42 (23.2)	
Master-granting	73 (40.3)	
Doctoral-granting	66 (36.5)	
Total Student Enrollment		
<10,000	127 (70.2)	
10,000–19,999	23 (12.7)	
20,000–29,999	17 (9.4)	
30,000 or more	14 (7.7)	

Legend: No. = Number, SD = Standard deviation

Coding Results

The qualitative data on free-form comments from 181 survey respondents were coded according to Bolman and Deal's criteria for coding frame responses, as given in Appendix E, Table 4.4. The majority (50.3%) of directors used single approaches when managing change, while 28.2% used dual approaches (Table 5.23). Multiple approaches were only used by 21.5% of all respondents.

Directors seemed to prefer the structural approach. They defined the rationale for change, re-engineered structure, redesigned facilities, reassigned duties, expanded the units, increased the size of staff, reviewed the position descriptions with personnel on a frequent basis, engaged in long-term planning, and established shared goals and objectives. At various times, directors also chose the human resource, political, and symbolic approaches. They managed change using staff involvement, communication, empowering staff, training and supporting people, and listening. They mainly obtained assistance from the state system, and resolved conflicts. They developed visions and values, celebrated successes, and worked on morale problems.

Other approaches chosen included ex-sourcing, outsourcing or bringing in outside consultants as well as facilitators. This method was chosen when the directors were in need of taking staff to other libraries, identifying obstacles to change and strategies, and helping with communication and leadership development.

The structural and human resource approaches were favored by directors choosing dual or multiple frames. These two approaches blend nicely together and enable the

directors to focus on both goals and their staff while managing change. Directors spend much of their time working with a variety of people and realigning roles and duties of staff to readdress changes brought on by technology.

Dependent Variables

Table 5.23 shows descriptive statistical results of the dependent variables used in the analysis. The dependent variable is the directors' approaches to managing change. It encompasses single, dual, and multiple approaches. The single approaches have five subcategories: (1) structural; (2) human resource; (3) political; (4) symbolic; and (5) other.

Table 5.23: Coding Results on Academic Library Directors' Approaches Used in Response to Question 18: Please Comment on Any Approach You Have Employed To Manage Change since You Became a Director (N = 181)

Approaches Used	No. of Responses	(%)
SINGLE APPROACHES		
▪ Structural	23	(12.7)
▪ Human resource	49	(27.1)
▪ Political	6	(3.3)
▪ Symbolic	6	(3.3)
▪ Other Use a completely different approach	7	(3.9)
Total responses	91	(50.3)
DUAL APPROACHES		
▪ Structural and human resource	37	(20.4)
▪ Structural and symbolic	2	(1.1)
▪ Structural and other	1	(0.6)
▪ Human resource and political	4	(2.2)
▪ Human resource and symbolic	6	(3.3)
▪ Human resource and other	1	(0.6)
Total Responses	51	(28.2)
MULTIPLE APPROACHES		
▪ Structural, human resource, political, and symbolic	1	(0.6)
▪ Structural, human resource, and political	9	(5.0)
▪ Structural, human resource, and symbolic	23	(12.7)
▪ Structural, human resource, and other	3	(1.7)
▪ Structural, human resource, symbolic, and other	1	(0.6)
▪ Human resource, political, and symbolic	2	(1.1)
Total Responses	39	(21.5)

Legend: No. Number

Independent Variables

Independent variable statistics are noted in Table 5.24. Gender is a nominal variable. Age, education level, library size, and the number of subordinates are ordinal

variables. Library type is a nominal variable with three categories. The other statistics (years of work, number of different positions, etc.) are continuous variables.

Age had nine categories (25–29 years, 30–34 years, and on up to > 65 years). Six educational levels were noted, ranging from bachelors degree to doctorate. Choices of library type were based on the Carnegie classifications, and the library size coincided with student enrollment. The high correlation between the number of subordinates and the number of library branches (r = .750) may indicate a potential multicollinearity problem. Therefore, the original continuous variable of the number of subordinates was recoded to four categories.

Table 5.24: Descriptive Statistics of Independent Variables Used in the Analysis (N = 181)

Variables	Percent/Mean	SD
Male	42%	---
Age (9-point scale)	7.0[a]	7.0[b]
Education level (6-point scale)	4.0[a]	5.0[b]
Years of present position	9.3	8.3
Total years of all directorship	13.1	9.6
Total years of library service	27.8	9.4
No. of different positions	5.1	3.3
No. subordinates	2.0[a]	3.0[b]
No. library branches	1.7	4.1
Library type (3-point scale)	2.0[a]	2.0[b]
Library size (4-point scale)	1.0[a]	3.0[b]

Legend: No. = Number, SD = Standard deviation

[a] Median, [b] Range

Results of Bivariate Crosstabulation and χ^2 Test

The bivariate cross-tabulation indicated that there were many significant associations between the independent variables and the directors' approaches to managing change (Table 5.25). The chi-square test was used to check whether two nominal variables are independent from or related to each other (Sarantakos 2005, 385). The collected continuous variables were recoded as the categorical ones. The ordinal variables with more categories were also recoded for the sake of reliable results. Results indicated that demographics, human capital, and library characteristics could be used to predict respondents' approaches to managing change.

The χ^2 test displayed a statistically significant relationship between gender and approaches to managing change at the .10 level. The minimum expected count is 16.38. The result can be trusted. The results show that males were more likely than females to use single and multiple approaches to manage change, while females were more likely than males to use dual approaches.

The χ^2 tests did not demonstrate any statistically significant relationships between directors' approaches and these predictors: age, education level, library type, and library size at the .10 level. However, the percentage results show that directors who were twenty-five to thirty-nine employed single approaches more, while directors who were sixty or more used the multi-frame approach more. Those who obtained MA/MS not in library science and other used dual and multiple approaches more, while those who had PhD used the single approach more. Those who worked for a doctoral-granting college or

university used single and multiple approaches more. Those who worked for a college or university with less than 10,000 student enrollment used the single approach more, while those who worked for a college or university with 20,000 or more student enrollment used the multi-frame approach more.

In Table 5.25 (continued) below, the χ^2 tests show that there were no significant relationships between directors' approaches and these variables: years of present position and years of all directorship at the .10 level. However, the percentage results display that directors who had been in their current positions for fewer than one year to four years used the multi-frame approach more, while those for five to nine years used dual approaches more. Those who had been in directorship for fewer than one year to four years utilized the multi-frame approach more.

According to the result of the χ^2 test, there was a significant relationship between directors' approaches and total years of library service at the .10 level. But, the minimum expected count is less than 5.0. The result cannot be trusted. However, the percentage result demonstrates that directors who served in libraries for fewer than one year to fourteen years employed dual and multiple approaches more.

The χ^2 tests did not detect any significant relationship between directors' approaches and these variables: number of different positions and number of subordinates at the .10 level. However, the percentage results show that those who held one to three different positions used dual and multiple approaches more. Directors who oversaw thirty or more subordinates utilized the multi-frame approach more, while those who oversaw

twenty to twenty-nine subordinates employed dual approaches more.

According to the result of the χ^2 test, there was a significant relationship between directors' approaches and number of library branches at the .10 level. The minimum expected count is 10.56. Thus, the result can be trusted. Those who oversaw one library branch were more likely to use the multi-frame approach, while those who didn't oversee any branch were more likely to use single and dual approaches.

Table 5.25. Percentage Distribution of Directors' Attitudes toward Approaches Used to Manage Change (N = 181)

	Approaches Used (%)				
	Single	Dual	Multiple	Total	No.
Gender					
Female	46.7	34.3	19.0	100.0	(105)
Male	55.3	19.7	25.0	100.0	(76)
χ^2 4.685, df 2, p .096					
Age					
25 39	57.1	28.6	14.3	100.0	(7)
40-59	48.2	30.0	21.8	100.0	(110)
60- 65	53.1	25.0	21.9	100.0	(64)
χ^2 .803, df 4, p .938					
Education Level					
MA/MS not in Library Science & Other	16.7	50.0	33.3	100.0	(6)
MLS	50.0	28.1	21.9	100.0	(64)
MLS plus other master's degree	53.2	27.4	19.4	100.0	(62)
PhD	51.0	26.5	22.4	100.0	(49)
χ^2 3.082, df 6, p .798					
Type of Institution					
Baccalaureate-granting	47.6	35.7	16.7	100.0	(42)
Master-granting	45.2	34.2	20.5	100.0	(73)
Doctoral-granting	57.6	16.7	25.8	100.0	(66)
χ^2 7.078, df 4, p .132					
Total Student Enrollment					
10,000	50.4	29.9	19.7	100.0	(127)
10,000 19,999	52.2	30.4	17.4	100.0	(23)
20,000 or more	48.4	19.4	32.3	100.0	(31)
χ^2 3.113, df 4, p .539					
Total	50.3	28.2	21.5	100.0	
No.	(91)	(51)	(39)	(181)	

Legend: No. Number

Table 5.25 (continued)

	Approaches Used (%)				
	Single	Dual	Multiple	Total	No.
Years of Present Position					
0 - 4	43.5	29.0	27.4	100.0	(62)
5 - 9	45.5	32.7	21.8	100.0	(55)
10 or more	60.9	23.4	15.6	100.0	(64)
χ^2 5.226, df 4, p .265					
Years of All Directorship					
0 - 4	51.4	21.6	27.0	100.0	(37)
5 - 9	43.9	29.3	26.8	100.0	(41)
10 - 14	46.9	31.3	21.9	100.0	(32)
15 or more	54.9	29.6	15.5	100.0	(71)
χ^2 3.713, df 6, p .715					
Years of Library Services					
0 - 14	29.4	35.3	35.3	100.0	(17)
15 - 29	55.9	19.1	25.0	100.0	(68)
30 or more	50.0	33.3	16.7	100.0	(96)
χ^2 8.019, df 4, p .091					
Number of Different Positions					
0 - 3	47.4	29.8	22.8	100.0	(57)
4 - 6	50.6	28.4	21.0	100.0	(81)
7 or more	53.5	25.6	20.9	100.0	(43)
χ^2 .406, df 4, p .982					
Number of Subordinates					
1 - 9	51.0	27.5	21.6	100.0	(51)
10 - 19	60.0	28.9	11.1	100.0	(45)
20 - 29	43.5	34.8	21.7	100.0	(23)
30 or more	45.2	25.8	29.0	100.0	(62)
χ^2 5.770, df 6, p .449					
Number of Library Branches					
0	51.9	33.8	14.3	100.0	(77)
1	52.7	16.4	30.9	100.0	(55)
2 or more	44.9	32.7	22.4	100.0	(49)
χ^2 8.457, df 4, p .076					
Total	50.3	28.2	21.5	100.0	
No.	(91)	(51)	(39)	(181)	

Legend: No. Number

Results of Correlations

In Table 5.26 Parts 1 – 2 (see Appendix G), bivariate correlations show that there are many significant correlations between the independent variables and the directors' approaches to managing change.

Correlations between Independent Variables and Dependent Variables

Table 5.26 (Part 1) (see Appendix G) demonstrates the correlations between independent variables and dependent variables. The correlation between male and respondents' use of the structural approach was positive and significant. Males were more likely than females to use the structural approach to manage change. The variable of education level was significantly and positively correlated with directors' structural approach to managing change. This demonstrates that those with higher education were more likely to use the structural approach to manage change than those who had lower education.

A statistically significant and positive correlation between years of present position and the use of the human resource approach was detected. For longer periods of time directors had been in their present positions, the more likely they were to use the human resource approach than their counterparts.

Number of different positions was significantly and negatively correlated with directors' political approach used . Those who held more different positions were less likely to use the political approach than those who held fewer various positions.

Education level was detected to be negatively and significantly correlated with

the symbolic approach. Directors with higher education were less likely to use the symbolic approach than those with lower education. The correlation between total years of directorship and the symbolic approach was negative and significant. Directors who had been in their current positions for longer periods of time were less likely to use the symbolic approach than their counterparts.

The correlation between number of library branches and use of other approaches was detected to be positive and significant. Directors who oversaw more library branches were more likely to use other approaches than their counterparts.

There was a positive and very significant correlation between library type and use of other approaches. Directors who worked for a higher academic degree college or university were more likely to use other approaches than those working in a lower academic degree college or university. The correlation between library size and use of other approaches was positive and very significant. Directors who worked in a college or university with higher enrollment were more likely to use other approaches than those working in a college or university with lower enrollment.

The predictor of total years at present position was significantly and positively correlated with the use of single approaches. Directors who had been in their current positions for longer periods of time were more likely to use single approaches than those who served in their current positions for shorter periods of time.

The correlation between male and use of dual approaches was significant and negative. Males were less likely to use dual approaches when managing change.

compared with females. There was a negative and very significant correlation between library type and use of dual approaches. Directors who worked for a higher academic degree college or university were less likely to use dual approaches than their counterparts.

A negative and significant correlation between total years of directorship and use of multiple approaches was detected. For longer periods of time directors had been in directorship, the less likely they were to use multiple approaches than their counterparts. This rejects the hypothesis that those who have been in directorship for longer periods of time are more likely to use the multi-frame approach than their counterparts.

The predictor of total years of library service was detected to be negatively and very significantly correlated with the use of multiple approaches. For longer periods of time directors served in libraries, the less likely they were to use multiple approaches. This rejects the hypothesis that those who have been in a service for longer periods of time are more likely to use the multi-frame approach to manage change than their counterparts.

The correlation between number of different library professional positions and use of multiple approaches was detected to be positive and significant. The more different positions directors held, the more likely they were to use multiple approaches. This supports the hypothesis that those who have held more different professional positions are more likely than their counterparts to use the multiple approaches to manage change.

The correlation between library size and use of multiple approaches was positive and significant. Directors who worked in a college or university with higher enrollment were more likely to use multiple approaches than their counterparts. This supports the hypothesis that directors who work at schools with higher enrollment are more likely to use the multi-frame approach than their counterparts.

There was a negative and significant correlation between total years of present position and use of dual and multiple approaches. For longer periods of time directors had in their current positions, the less likely they were to use dual and multiple approaches rather than single approaches than their counterparts.

The above-discussed correlations between predictors and dependent variables were significant. However, they were very weak and low because their calculated r values were below .30. The calculated r values did not illustrate moderate correlations (.40 to .70) and strong correlations (.70 or more).

Correlations among Independent Variables

The correlations among independent variables are also given in Table 5.26 (Part 2) (see Appendix G). The final correlation between number of subordinates and number of branches was not detected to be high, indicating no multicollinearity problem. The other variables did not have a high degree of collinearity. The correlations ranged from -.002 to .481. These three categories of predictors—demographics, human capital, and library characteristics—could be used to predict respondents' approaches to managing change.

Results of Multinomial and Binary Logistic Regressions

The hypotheses of this study focus on directors' use of multiple approaches versus single approaches. Thus, "single approaches" is used as the reference category. Table 5.27 below reports multinomial logistic regression estimates that predict directors' approaches to managing change. The estimated pseudo R^2 displays that this set of variables/subscales explains 17.7% of the variation in the directors' approaches to managing change. Results show that independent variables: library type and total years of library service, show significant impact on the outcome variables.

There was a negative and very significant relationship between library type and single approaches versus dual approaches. This implies that each additional level in library type decreased the likelihood by 51.0% in using dual approaches rather than single approaches. For the higher academic degree college or university directors worked, the less likely they were to use dual approaches than those who worked for lower academic degree college or university.

The negative and significant relationship between total years of library service and single approaches versus multiple approaches was detected. Each additional year of library service decreased the likelihood by 6.3% in using multiple approaches rather than single approaches. Those who had more years of library service were less likely to use multiple approaches than those who served in libraries for shorter periods of time. This rejects the hypothesis that directors who have been in library service for longer periods of

time are more likely than their counterparts to use the multi-frame approach than any other type of approach when dealing with change.

The relationship between male and use of dual approaches was detected to be marginally significant (significance close to .10). The other variables might not have any significant impact of the directors' approaches used (significance far from .10).

Binary logistic regression was used to check whether the results would change. Table 5.28 below reports binary logistic regression estimates that predict directors' approaches to managing change. The estimated pseudo R^2 displays that this set of variables/subscales explains 7.3% of the variation in the directors' approaches to managing change. Results demonstrate that library type still shows significant impact on the outcome variable. However, the total years of library service did not significantly influence respondents' approaches.

Table 5.27: Multinomial Logistic Regression Estimates Predicting Approaches to Managing Change (N = 181)

	Dual Approaches vs. Single Approaches		Multiple Approaches vs. Single Approaches	
Predictors	*B*	exp(*B*)	*B*	exp(*B*)
Male	-.652	.521	.254	1.289
	(.405)		(.427)	
Age	-.085	.919	.250	1.284
	(.183)		(.190)	
Education Level	-.084	.920	-.141	.868
	(.171)		(.188)	
Years of Present Position	-.035	.966	-.009	.991
	(.031)		(.035)	
Total Years of Directorship	.022	1.022	-.007	.993
	(.028)		(.032)	
Total Years of	.020	1.020	-.065**	.937
Library Service	(.032)		(.030)	
No. of Different	-.074	.928	.074	1.077
Positions	(.088)		(.067)	
No. of	.205	1.228	.208	1.231
Subordinates	(.181)		(.194)	
No. of Library	.079	1.082	.001	1.001
Branches	(.057)		(.066)	
Library Type	-.714**	.490	-.146	.864
	(.310)		(.330)	
Library Size	-.071	.931	.229	1.258
	(.272)		(.245)	
Constant	1.348		-1.201	
	(1.192)		(1.319)	
-2 log likelihood		342.3		
Model χ^2		30.4		
Pseudo R^2		.177		
Df		22		
N		181		

Notes: The *B* is the logistic regression coefficient; exp (*B*) or odds ratio is the antilog of *B*; and standard errors are in parentheses.
*p < 0.10; **p < 0.05; ***p < 0.01; ****p < 0.001

Table 5.28: Binary Logistic Regression Estimates Predicting Approaches to Managing Change (N = 181)

	Dual & Multiple Approaches vs. Single Approaches	
Predictors	*B*	exp(*B*)
Male	-.248	.780
	(.329)	
Age	.096	1.100
	(.148)	
Education Level	-.117	.889
	(.143)	
Years of Present Position	-.023	.977
	(.026)	
Total Years of Directorship	.012	1.012
	(.023)	
Total Years of Library Service	-.027	.973
	(.023)	
No. of Different Positions	.020	1.020
	(.053)	
No. of Subordinates	.208	1.231
	(.151)	
No. of Library Branches	.041	1.042
	(.050)	
Library Type	-.447*	.640
	(.255)	
Library Size	.081	1.085
	(.204)	
Constant	.855	2.352
	(.992)	
-2 log likelihood		240.7
Model χ^2		10.2
Pseudo R^2		.073
Df		11
N		181

Notes: The *B* is the logistic regression coefficient; exp (*B*) or odds ratio is the antilog of *B;* and standard errors are in parentheses.

*p≤0.10; **p≤0.50; ***p ≤ 0.01; ****p ≤ 0.001

Table 5.29 reports on the multinomial logistic regression estimates predicting the directors' approaches to managing change by taking into account the independent variables used in this study. As a reference category, the human resource approach was used more often than any other single approach. The estimated pseudo R^2 displays that this set of variables/subscales explains 40.3% of the variation in the directors' approaches to managing change in the information age. Results show that independent variables, such as age, number of different professional positions, library type, and total years of library service, significantly impact the outcome variables.

Age was positively and significantly associated with the probability of using the structural approach rather than human resource approach to managing change. This means that each additional level in age increased the likelihood by 80.0% in using the structural approach rather than human resource approach. The older respondents were more likely than their counterparts to manage change through defining the rationale for change, or re-engineering structure, or redesigning facilities, or reassigning duties, or engaging in long-term planning, or establishing shared goals and objectives.

A significant and negative relationship between age and human resource approach versus other approach was detected. Each additional level in age decreased the likelihood by 73.3% in using other approaches rather than the human resource approach to manage change. The older directors were, the less likely they were to use other approaches than the younger ones.

Age was positively and significantly associated with the probability of using

multiple approaches rather than the human resource approach to manage change. Each additional level in age increased the likelihood by of using multiple approaches by 48.7%. Directors who were older were more likely to use multiple approaches while managing change than the younger ones. This supports the hypothesis that directors who are older are more likely to use the multi-frame approach than their counterparts. Age did not have any significant effect on the other categories: the human resource approach versus political, symbolic, and dual approaches.

There was a significant and negative relationship between number of different professional positions and the human resource versus political approach. Each additional number in different professional positions decreased the likelihood by 62.5% in using the political approach rather than human resource approach. Those who had held more different professional positions were less likely to use the political approach to mange change than those who had held fewer different positions.

Library size was detected to be positively and significantly related to the use of the human resource approach versus other approaches. Those who worked in a college or university with higher enrollment were 2.6 times as likely as those who worked in a college or university with lower enrollment to use other approaches to manage change.

The relationship between library type and the human resource approach versus dual approaches was detected to be significant and negative. Each additional level in library type decreased the likelihood by 52.9% in using dual approaches rather than the human resource approach. For higher academic degree of a college or university directors

worked, the less likely they were to use dual approaches to manage change than their counterparts.

There was a significant and negative relationship between years of all library services and the human resource versus multiple approaches. Each additional year in all library services decreased the likelihood by 7.5% in using multiple approaches rather than the human resource approach. For longer periods of time directors served, the less likely they were to use multiple approaches than their counterparts. This rejects the hypothesis that directors who have been in library services for longer periods of time are more likely than their counterparts to use the multi-frame approach than any other approach when dealing with change.

The relationship between total years of directorship and the human resource approach versus symbolic approach was detected to be marginally significant (significance close to .10). The other variables might not have any significant impact of the directors' approaches used (significance far from .10).

Table 5.29: Multinomial Logistic Regression Estimates Predicting Directors' Approaches to Managing Change (N = 181)

	Structural vs. Human Resource		Political vs. Human Resource		Symbolic vs. Human Resource	
Predictors	*B*	exp(*B*)	*B*	exp(*B*)	*B*	exp(*B*)
Male	.749	2.115	1.089	2.970	-.730	.482
	(.562)		(1.167)		(1.267)	
Age	.588**	1.800	-.046	.955	.167	1.182
	(.272)		(.572)		(.493)	
Education	.190	1.210	-.675	.509	-.927	.396
	(.247)		(.598)		(.610)	
Years of Present Position	-.034	.966	.033	1.034	.011	1.011
	(.046)		(.074)		(.097)	
Total Years of Directorship	-.041	.960	-.074	.929	-.177	.838
	(.042)		(.080)		(.112)	
Total Years of Library Service	-.039	.962	.126	1.135	.001	1.001
	(.043)		(.098)		(.076)	
No. of Different Positions	-.130	.878	-.981**	.375	.006	1.006
	(.128)		(.447)		(.119)	
No. of Subordinates	.090	1.094	-.491	.612	-.128	.880
	(.274)		(.531)		(.460)	
No. of Library Branches	-.027	.973	-.168	.845	-.425	.654
	(.135)		(.446)		(.527)	
Library Type	-.389	.678	.154	1.167	.408	1.504
	(.442)		(.809)		(.758)	
Library Size	.021	1.021	.950	2.585	-.111	.895
	(.403)		(.615)		(.624)	
Constant	-2.891		.260		1.675	
	(1.884)		(3.361)		(3.517)	
-2 log likelihood				508.9		
Model χ^2				88.9		
Pseudo R^2				.403		
df				66		
N				181		

Notes: The *B* is the logistic regression coefficient; exp (*B*) or odds ratio is the antilog of *B*; and standard errors are in parentheses.
*p< 0.10; **p< 0.50; ***p < 0.01; ****p < 0.001

Table 5.29 (continued)

Predictors	Other vs. Human Resource *B*	exp(*B*)	Dual vs. Human Resource *B*	exp(*B*)	Multiple vs. Human Resource *B*	exp(*B*)
Male	-.127	.880	-.427	.652	.475	1.608
	(.946)		(.460)		(.486)	
Age	-1.319*	.267	.047	1.048	.397**	1.487
	(.710)		(.214)		(.223)	
Education	-.221	.802	-.119	.888	-.181	.834
	(.458)		(.194)		(.213)	
Years of Present Position	.057	1.058	-.044	.957	-.016	.984
	(.077)		(.035)		(.039)	
Total Years of Directorship	.068	1.070	.008	1.008	-.020	.980
	(.065)		(.032)		(.037)	
Total Years of Library Service	.084	1.088	.012	1.012	-.078**	.925
	(.097)		(.037)		(.035)	
No. of Different Positions	.211	1.235	-.129	.879	.037	1.038
	(.203)		(.099)		(.075)	
No. of Subordinates	.352	1.422	.166	1.181	.164	1.179
	(.422)		(.207)		(.223)	
No. of Library Branches	.026	1.027	.093	1.098	.006	1.006
	(.094)		(.080)		(.088)	
Library Type	1.690	5.421	-.753**	.471	-.180	.836
	(1.230)		(.354)		(.374)	
Library Size	.960**	2.611	.107	1.113	.399	1.490
	(.484)		(.319)		(.297)	
Constant	-4.901		1.765		-.798	
	(3.845)		(1.339)		(1.469)	
-2 log likelihood				508.9		
Model χ^2				88.9		
Pseudo R^2				.403		
df				66		
N				181		

Notes: The *B* is the logistic regression coefficient; exp (*B*) or odds ratio is the antilog of *B*; and standard errors are in parentheses.
*p < 0.10; **p < 0.50; ***p < 0.01; ****p < 0.001.

Free Comments on the Survey

Question 19. Please feel free to provide any comments regarding the survey questions and design.

Among 455 subjects in the final analysis, 32 respondents (7.0%) provided additional comments. Most respondents gave positive feedback and commented that this survey was well designed. However, some offered suggestions such as more clearly defining "ritual" or "ritualistic."

Question 20. Would you like to receive a brief report of this survey?

A majority of respondents (249, 54.7%) asked to receive a brief survey summary.

CHAPTER VI

FINDINGS AND DISCUSSION (CONTINUED)

This chapter reports and discusses the empirical results of eight multi-part questions which classify directors' approaches to planning change, setting goals for change, resolving conflict, communicating with the public and staff, managing change, conducting meetings, making change decisions, and evaluating change (see Appendix D for survey questionnaire on change management). These questions, based on two scenarios* adapted from Curzon (2005), are designed to gain insight into how directors use their approaches to manage change.

Questions 10 through 14 relate to the first scenario, a hypothetical situation where "Colin" has been named interim director following the dismissal of the original director, "Ken." These five questions are:

1. Question 10. How would you plan change if you were Colin?
2. Question 11: How would you set goals for change if you were Colin?
3. Question 12: How would you approach conflict resulting from Ken's supporters?
4. Question 13: How would you communicate with the public and your staff if you were Colin?

* Permission to use these two change scenarios in the survey was obtained from Dr. Curzon by e-mail before the pilot study.

5. Question 14: What approaches would you employ to manage change if you were Colin?

Questions 15 through 17 relate to the second scenario, a hypothetical situation where "Frank" is a newly hired director who is confronted with an extensive backlog of cataloging. These three questions are:

1. Question 15: How would you conduct meetings if you were Frank?
2. Question 16: How would you view decision making if you were Frank?
3. Question 17: How would you view evaluation if you were Frank?

Large-scale change causes a transformation and enables library resources and services to continuously meet the demands of students, faculty, and staff via an intensive planned and complex process. How this change is managed may well make the difference between a negative or positive outcome.

Curzon's (2005) two scenarios mentioned above and described in detail in the Appendix D present typical situations that academic library directors may face. The survey questions chosen reflect key elements of change management and were designed to help understand different ways that directors use to manage change.

For each question, descriptive results are reported and discussed first. Secondly, results of bivariate cross-tabulation and chi-square test are demonstrated and summarized. Thirdly, the results of correlations between independent variables and dependent variables are summarized and analyzed. Finally, the results of multinomial and binary logistic regressions are analyzed and discussed.

Approaches to Planning Change

Question 10. How would you plan change if you were Colin?

Descriptive Results

Question 10 was asked to ascertain how library directors would respond in a similar situation. The responses varied, although the majority of directors (57.4%) would use multiple approaches to plan change (Table 6.1). 29.9% would use dual approaches, while only 12.7% would use single approaches. No respondent would use single political, symbolic or other approach to plan change. No respondent checked N/A (not applicable) for each response.

The structural and human resource approaches were favored by directors choosing dual or multiple frames. These two approaches blend nicely together and enable the directors to focus on both goals and their staff while managing change. Directors spend much of their time working with a variety of people and realigning roles and duties of staff to readdress changes brought on by technology.

The "other" approach was checked by 42 (9.2%) respondents. Of these respondents, 24 commented on the "other" approach they would use. However, only one respondent "other" approach did not actually correspond to Bolman and Deal's model. This director commented about the use of an external facilitator to plan change. According to Bolman and Deal's criteria for coding the open-ended frame responses cited in Appendix E, five responses were actually the structural approach; eleven, human resources; one, political; and two, symbolic. The remaining 18 respondents did not

specify what their other approaches were and therefore could not be ruled out as not actually using "other approach" category in Table 6.1. As a result, 19 respondents are included in the "other approach" category in Table 6.1.

The free comments on the "other" approach respondents used demonstrate that directors used the human resource approach more than other approaches. They used planning to focus on people and communication. At the same time, they used the structural approach.

Dependent Variables

Table 6.1 shows descriptive statistical results of the dependent variables used in the analysis. The dependent variable is the directors' approaches to planning change. It consists of three main categories: (1) single approaches; (2) dual approaches; and (3) multiple approaches. The single approaches include two subcategories: (1) structural, and (2) human resource.

Table 6.1: Approaches Used in Response to Question 10: How Would You Plan Change if You Were Colin? (N = 455)

Approaches Used	No. of Responses	(%)
SINGLE APPROACHES		
STRUCTURAL		
▪ Use planning as a strategy to set change goals and objectives	27	(5.9)
HUMAN RESOURCE		
▪ Use planning as a gathering to promote people's involvement and participation	31	(6.8)
POLITICAL		
▪ Use planning as a way to approach conflicts and realign power	0	(0)
SYMBOLIC		
▪ Use planning in a ritualistic fashion	0	(0)
OTHER		
▪ Use a completely different approach	0	(0)
Total Responses	58	(12.7)
DUAL APPROACHES		
▪ Structural and human resource	84	(18.5)
▪ Structural and political	23	(5.1)
▪ Human resource and political	22	(4.8)
▪ Human resource and symbolic	4	(0.9)
▪ Human resource and other	3	(0.7)
Total Responses	136	(29.9)
MULTIPLE APPROACHES		
▪ Structural, human resource, and political	184	(40.4)
▪ Structural, human resource, political, and symbolic	56	(12.3)
▪ Structural, human resource, political, and other	13	(2.9)
▪ Structural, human resource, and symbolic	4	(0.9)
▪ Structural, human resource, and other	3	(0.7)
▪ Human resource, political, and symbolic	1	(0.2)
▪ Human resource, political, and symbolic	1	(0.2)
Total Responses	261	(57.4)

Legend: No. Number

Independent Variables

Statistical analyses of Questions 10 through 17, including the ranges of independent variables, are the same as those for Question 9 on page 104 of Chapter V Findings and Discussion (see the related analysis of Table 5.15 on page 105).

Results of Bivariate Crosstabulation and χ^2 Test

The bivariate cross-tabulation indicated that there were many significant associations between the independent variables and the directors' approaches to planning change (Table 6.2). The chi-square test was used to check whether two nominal variables are independent from or related to each other (Sarantakos 2005, 385). The collected continuous variables were recoded as the categorical ones. The ordinal variables with more categories were also recoded for the sake of reliable results. Results indicated that demographics, human capital, and library characteristics could be used to predict respondents' approaches to planning change.

In Table 6.2, the χ^2 test did not demonstrate any statistically significant relationships between directors' approaches and these predictors: gender, age, education level, and library size at the .10 level. However, the percentage results show that females used dual and multiple approaches to plan change more often than males. Directors who were 25 to 39 employed dual approaches more, while directors who were 40 to 59 used the multi-frame approach more. Those who obtained MA/MS not in library science and other used the multi-frame approach more, while those who got MLS utilized dual approaches more. Those who worked for a college or university with less than 10,000 total student enrollment used the single approach more, while those who worked for a college or university with 10,000 to 19,999 employed multiple approaches more.

The χ^2 test shows that there was a significant relationship between directors' approaches to planning change and library type at the .05 level. The minimum expected

count is 14.40. Thus, the result can be trusted. Those who worked for a baccalaureate-granting college or university were more likely to use the single approach, while those who worked for a doctoral-granting college or university were more likely to use the multi-frame approach. This supports the hypothesis that directors who work for a higher academic degree college or university are more likely than their counterparts to use the multi-frame approach while managing change.

In Table 6.2 (continued) below, the χ^2 test did not detect any significant relationships between directors' approaches to planning change and these variables: years at present position, total years of directorship, total years of library service, number of different positions, and number of subordinates at the .10 level. However, the percentage results show that directors who had been in their current positions for fewer than one year to four years used the multi-frame approach more to plan change, while those for ten years or more used dual approaches more to plan change. Those who had been in all directorship for fewer than one year to four years utilized the multi-frame approach more to plan change, while those for 15 years or more employed dual approaches more. Directors who served in libraries for fewer than one year to fourteen years used the multiple approaches more, while those for fifteen to twenty-nine used dual approaches to plan change. Those who held seven or more different positions used the multi-frame approach more, while those who held four to six different positions employed dual approaches more. Directors who oversaw thirty or more subordinates utilized the multi-

frame approach more to plan change, while those who oversaw twenty to twenty-nine subordinates used dual approaches more.

According to the result of the χ^2 test, there was a significant relationship between directors' approaches and number of library branches at the .10 level. The minimum expected count is 15.81. Thus, the result can be trusted. Those who oversaw two or more library branches were more likely to use the multi-frame approach, while those who oversaw one branch were more likely to use dual approaches to plan change.

Table 6.2: Percentage Distribution of Directors' Attitudes toward Approaches Used to Plan Change (N = 455)

	Approaches Used (%)				
	Single	Dual	Multiple	Total	No.
Gender					
Female	11.4	30.7	57.9	100.0	(254)
Male	14.4	28.9	56.7	100.0	(201)
χ^2 = .953, df = 2, p = .621					
Age					
25-39	3.8	38.5	57.7	100.0	(26)
40-59	13.1	28.6	58.3	100.0	(283)
60 or more	13.7	30.8	55.5	100.0	(146)
χ^2 = 2.712, df = 4, p = .607					
Education Level					
MA/MS not in Library Science & Other	16.7	16.7	66.7	100.0	(18)
MLS	13.0	31.6	55.4	100.0	(177)
MLS plus other master's degree	10.6	31.1	58.4	100.0	(161)
PhD	15.2	27.3	57.6	100.0	(99)
χ^2 = 3.238, df = 6, p = .778					
Type of Institution					
Baccalaureate-granting	17.7	32.7	49.6	100.0	(113)
Master-granting	15.7	28.1	56.2	100.0	(185)
Doctoral-granting	5.7	29.9	64.3	100.0	(157)
χ^2 = 12.555, df = 4, p = .014					
Total Student Enrollment					
< 10,000	14.6	30.4	55.0	100.0	(329)
10,000-19,999	10.8	24.6	64.6	100.0	(65)
20,000 or more	4.9	32.8	62.3	100.0	(61)
χ^2 = 5.984, df = 4, p = .200					
Total	12.7	29.9	57.4	100.0	
No.	(58)	(136)	(261)	(455)	

Legend: No. = Number

Table 6.2 (continued)

	Approaches Used (%)				
	Single	Dual	Multiple	Total	No.
Years of Present Position					
0 - 4	9.6	27.5	62.9	100.0	(167)
5 - 9	15.3	30.6	54.2	100.0	(144)
10 or more	13.9	31.9	54.2	100.0	(144)
$\chi 2$ 4.113, df 4, p .391					
Years of All Directorship					
0 - 4	9.3	24.1	66.7	100.0	(108)
5 - 9	13.9	32.2	53.9	100.0	(115)
10 - 14	13.9	29.1	57.0	100.0	(79)
15 or more	13.7	32.7	53.6	100.0	(153)
$\chi 2$ 5.440, df 6, p .489					
Years of Library Services					
0 - 14	5.4	28.6	66.1	100.0	(56)
15 - 29	15.1	30.8	54.1	100.0	(172)
30 or more	12.8	29.5	57.7	100.0	(227)
$\chi 2$ 4.319, df 4, p .365					
Number of Different Positions					
0 - 3	13.1	28.8	58.2	100.0	(153)
4 - 6	10.6	32.9	56.5	100.0	(207)
7 or more	16.8	25.3	57.9	100.0	(95)
$\chi 2$ 3.392, df 4, p .494					
Number of Subordinates					
1 - 9	13.3	32.8	53.9	100.0	(128)
10 - 19	16.3	26.0	57.7	100.0	(123)
20 - 29	12.3	36.9	50.8	100.0	(65)
30 or more	9.4	27.3	63.3	100.0	(139)
$\chi 2$ 6.467, df 6, p .373					
Number of Library Branches					
0	15.2	26.8	57.9	100.0	(164)
1	11.4	37.1	51.5	100.0	(167)
2 or more	11.3	24.2	64.5	100.0	(124)
$\chi 2$ 8.157, df 4, p .086					
Total	12.7	29.9	57.4	100.0	
No.	(58)	(136)	(261)	(455)	

Legend: No. Number

Results of Correlations

Table 6.3 below reports the results of bivariate correlations among variables used in the analysis.

Correlations between Independent Variables and Dependent Variables

The results of this study concurred with the hypotheses presented earlier regarding the use of multiple approaches (Table 6.3). However, calculated r values for the variables were < .30, making the correlations very weak or low rather than moderate or strong. In this study, there was no significant association between gender and directors' multiple approaches used. Correlation between library type and the use of multiple approaches were detected to be positive and significant. Weak correlation was also noted between library type and the use of dual and multiple approaches. Directors who worked at a large school or library were more likely to use multiple approaches or dual and multiple approaches to plan change than their counterparts. However, the study results did not coincide with other hypotheses.

Correlation between library size and the use of dual and multiple approaches was detected to be positive and significant. Directors who worked at a large school or library were more likely than their counterparts to use dual and multiple approaches when planning change. However, the correlation between number of different positions was detected to be negative and significant. Directors who held more different positions were less likely than their counterparts to use dual and multiple approaches.

There were many significant correlations between the independent variables and the approaches to planning change. The structural approach was more likely to be used by directors having higher education levels or holding their current positions for longer periods of time. However, negative correlations were noted for directors who had more subordinates, worked at a large school or library in addition to working at universities with higher enrollment.

The human resource approach was more likely to be used by directors who held more different professional positions or oversaw more subordinates. The single approach was more likely to be used by directors who held more different positions. However, negative correlations were noted for directors who worked at a large school or library, or at universities with higher enrollment.

Table 6.3: Correlation Matrix for Variables Used in the Analysis (N = 455)

Approaches to Planning Change

	A	B	C	D	E	F
1	.001	.058	.045	-.020	-.012	-.045
2	-.002	.044	.032	-.026	.002	-.032
3	.082**	-.045	.024	.014	-.030	-.024
4	.088**	-.058	.019	.022	-.033	-.019
5	.041	-.016	.017	.047	-.055	-.017
6	.009	.055	.048	.011	-.042	-.048
7	.051	.062*	.083**	-.024	-.034	-.083**
8	-.146****	.061*	-.057	-.025	.062	.057
9	-.060	.007	-.037	.014	.012	.037
10	-.141****	-.057	-.143****	-.020	.115***	.143****
11	-.114***	-.027	-.101**	.024	.046	.101**

Notes: A = Structural, B = Human Resource, C = Single, D = Dual, E = Multiple,
F = Single Approaches vs. Dual & Multiple Approaches
1 = Male, 2 = Age, 3 = Education, 4 = Years at Present Position, 5 = Total Years of Directorship,
6 = Total Years of Library Service, 7 = No. of Different Positions, 8 = No. of Subordinates,
9 = No. of Library Branches, 10 = Library Type, 11 = Library Size
*p < 0.10; **p < 0.05; ***p < 0.01; ****p < 0.001

Correlations among Independent Variables

The correlations among independent variables are the same as those given in Table 5.17 (Part 2) on page 374 of Chapter V Findings and Discussion. These results also apply to the following questions 11 – 17 in this chapter in terms of correlations among independent variables.

Results of Multinomial and Binary Logistic Regressions

The hypotheses of this study focus on directors' use of multiple approaches versus single approaches. Thus, "single approaches" is used as the reference category. Table 6.4 reports the multinomial logistic regression estimates that predict directors' approaches to planning change. The estimated pseudo R^2 displays that this set of variables/subscales explains 6.4% of the variation in directors' approaches to planning change. The results show that independent variables--- number of different professional positions and library type — significantly impact the outcome variables.

The relationship between number of different professional positions and the use of single approaches versus dual approaches was significant and negative. Each additional number of different professional positions decreased the likelihood of using dual approaches by 9.4%. Directors who held more different professional positions would be less likely than their counterparts to use dual approaches to plan change than their counterparts.

There was a positive and significant relationship between number of different professional positions and the use of single approaches versus multiple approaches. Each additional number of different positions increased the likelihood of using multiple approaches by 10%. Those who held more different positions would be more likely to use multiple approaches than those with fewer different positions. This supports the hypothesis that directors who held more different professional positions are more likely

than their counterparts to use the multi-frame approach than any other type of approach when dealing with change.

A positive and very significant relationship between library type and the use of single approaches versus multiple approaches was detected. Each additional level in library type increased the likelihood of using multiple approaches by 88.4%. For a higher academic degree college or university directors worked, the more likely they would be to use multiple approaches to plan change than their counterparts. This supports the hypothesis that directors who work for an institution offering a higher academic degree are more likely than their counterparts to use the multi-frame approach than any other type of approach when dealing with change.

The relationship between library type and the use of dual approaches was detected to be marginally significant (significance near .10). The other variables might not have any significant impact of the directors' approaches used (significance far from .10).

Binary logistic regression was used to check whether the results would change. Table 6.5 lists binary logistic regression estimates that predict directors' approaches to planning change. The estimated pseudo R^2 indicates that this set of variables/subscales explains 8.0% of the variation regarding the directors' approaches to planning change. Results display that the predictors of number of different professional positions and library type show significant impact on the outcome variables. The other variables might not influence the directors' approaches used (significance far from .10).

Table 6.4: Multinomial Logistic Regression Estimates Predicting Approaches to Planning Change (N = 455)

	Dual Approaches vs. Single Approaches		Multiple Approaches vs. Single Approaches	
Predictors	*B*	exp(*B*)	*B*	exp(*B*)
Male	-.392	.676	-.319	.727
	(.336)		(.313)	
Age	-.094	.911	.006	1.006
	(.146)		(.137)	
Education Level	-.093	.911	-.148	.862
	(.153)		(.144)	
Years of Present Position	-.006	.994	-.002	.998
	(.027)		(.025)	
Total Years of Directorship	.025	1.025	.006	1.006
	(.025)		(.023)	
Total Years of	-.015	.985	-.025	.975
Library Service	(.025)		(.023)	
No. of Different	-.099*	.906	.105**	.900
Positions	(.059)		(.052)	
No. of	.005	1.005	.076	1.079
Subordinates	(.162)		(.151)	
No. of Library	-.027	.974	-.039	.962
Branches	(.060)		(.058)	
Library Type	.412	1.511	.633***	1.884
	(.259)		(.241)	
Library Size	.416	1.516	.310	1.363
	(.299)		(.288)	
Constant	1.335		1.541	
	(.955)		(.902)	
-2 log likelihood		830.8		
Model χ^2		25.4		
Pseudo R^2		.064		
Df		22		
N		455		

Notes: The *B* is the logistic regression coefficient; exp (*B*) or odds ratio is the antilog of *B*; and standard errors are in parentheses.
*p < 0.10; **p < 0.05; ***p < 0.01; ****p < 0.001

Table 6.5: Binary Logistic Regression Estimates Predicting Approaches to Planning Change (N = 455)

	Dual & Multiple Approaches vs. Single Approaches	
Predictors	*B*	exp(*B*)
Male	-.344	.709
	(.302)	
Age	-.028	.972
	(.133)	
Education Level	-.129	.879
	(.139)	
Years of Present Position	-.004	.996
	(.024)	
Total Years of Directorship	.013	1.013
	(.023)	
Total Years of Library Service	-.022	.978
	(.022)	
No. of Different Positions	-.103**	.902
	(.050)	
No. of Subordinates	.051	1.053
	(.147)	
No. of Library Branches	-.034	.966
	(.057)	
Library Type	.557**	1.746
	(.232)	
Library Size	.347	1.415
	(.283)	
Constant	2.121**	8.336
	(.875)	
-2 log likelihood		327.5
Model χ^2		19.8
Pseudo R^2		.080
Df		11
N		455

Notes: The *B* is the logistic regression coefficient; exp (*B*) or odds ratio is the antilog of *B*; and standard errors are in parentheses.

*p < 0.10; **p < 0.50; ***p < 0.01; ****p < 0.001

Table 6.6 reports on the multinomial logistic regression estimates that predict the directors' approaches to planning change. As a reference category, the human resource approach was used more often than any other single approach. The estimated pseudo R^2 indicates that this set of variables/subscales explains 12.2% of the variation of the directors' approaches to planning change. Results show that independent variables, such as education level, years of present position, number of subordinates, male, and library type , significantly influence directors' approaches used.

Education level was detected to be positively and highly significantly associated with the probability of using the structural approach rather than the human resource approach to plan change. Each additional level in education increased the likelihood by 108% that directors would use the structural approach rather than the human resource approach. Those with higher education would be more likely to use the structural approach than those with less education. However, education level did not affect the use of the human resource approach versus dual and multiple approaches.

There was a positive and significant relationship between years of present position and the use of the human resource versus structural approach. Each additional year in a current position increased the likelihood by 9.5% of using the structural approach rather than human resource approach. For longer periods of time directors were in their current positions, the more likely they would be to use the structural approach to plan change than their counterparts.

The relationship between number of subordinates and the human resource

approach versus structural approach was detected to be negative and significant. Each additional level in subordinates decreased the likelihood by 55.7% in using the structural approach rather than the human resource approach. The more subordinates directors oversaw, the less likely they would be to use the structural approach to plan change than their counterparts.

The predictor of male was detected to be negatively and significantly related with the use of the human resource approach versus dual approaches. Males would be about 51% less likely than females to use dual approaches rather than the human resource approach to plan change.

The relationship between library type and the human resource approach versus multiple approaches was detected to be positive and significant. Each additional level in library type increased the likelihood by 92.6% in using multiple approaches rather than the human resource approach. This supports the hypothesis that directors who work at research libraries are more likely to use the multi-frame approach than their counterparts.

In terms of using the human resource approach versus dual approaches, number of subordinates was detected to be a marginally significant predictor if the sample size were larger (significance close to .10). This was also true for the relationship between male and the human resource approach versus the multi-frame approach. However, the results of other variables did not significantly impact the directors' approaches used (significance far from .10).

Table 6.6: Multinomial Logistic Regression Estimates Predicting Approaches to Planning Change (N = 455)

	Structural vs. Human Resource		Dual vs. Human Resource		Multiple vs. Human Resource	
Predictors	*B*	exp(*B*)	*B*	exp(*B*)	*B*	exp(*B*)
Male	-.794	.452	-.702*	.495	-625	.535
	(.587)		(.425)		(.406)	
Age	-.158	.854	-.160	.852	-.059	.943
	(.253)		(.193)		(.185)	
Education	.732***	2.080	.255	1.291	.195	1.216
	(.269)		(.213)		(.205)	
Years of Present Position	.091*	1.095	.045	1.046	.050	1.051
	(.048)		(.040)		(.039)	
Total Years of Directorship	.002	1.002	.017	1.017	-.002	.998
	(.043)		(.032)		(.031)	
Total Years of Library Service	-.026	.974	-.021	.979	-.032	.969
	(.043)		(.031)		(.030)	
No. of Different Positions	.089	1.093	-.058	.944	-.065	.937
	(.089)		(.080)		(.074)	
No. of Subordinates	-.814**	.443	-.328	.720	-.254	.776
	(.304)		(.205)		(.196)	
No. of Library Branches	-.012	.988	-.021	.979	-.034	.967
	(.182)		(.065)		(.063)	
Library Type	.122	1.130	.434	1.544	.656*	1.926
	(.443)		(.324)		(.309)	
Library Size	-.656	.519	.296	1.344	.190	1.209
	(.747)		(.344)		(.333)	
Constant	.173		1.844		2.051	
	(1.735)		(1.266)		(1.223)	
-2 log likelihood				885.2		
Model χ^2				51.1		
Pseudo R^2				.122		
df				33		
N				455		

Notes: The *B* is the logistic regression coefficient; exp (*B*) or odds ratio is the antilog of *B*; and standard errors are in parentheses.
*p 0.10; **p 0.50; ***p 0.01; ****p 0.001.

Approaches to Setting Goals for Change

Question 11. How would you set goals for change if you were Colin?

Descriptive Results

As shown in Table 6.7 below, 90.1% of directors would use multiple approaches to set goals for change if they were Colin. Only 4.2% would use dual approaches. The total single approaches would only be used by 5.7% of all respondents. No respondent would use single political, symbolic or other approach to set goals for change. No respondent checked N/A (not applicable) for each response.

The structural and human resource approaches were favored by directors choosing dual or multiple approaches. Most likely, these approaches appear together more often over the others because directors spend much of their time working with a variety of people and realigning roles and duties of staff in current academic libraries that are caught up in the mode of rapidly changing technology.

The "other" approach was noted by 37 (8.1%) respondents. Of these respondents, 15 commented on the "other" approach they would use. However, no respondent listed a true "other" approach. According to Bolman and Deal's criteria for coding the open-ended frame responses cited in Appendix E, four responses were actually the structural approach; five, human resources; one, political; two, symbolic; one, dual approach; and two, comments. The remaining 22 respondents did not specify what their other approaches were and therefore could not be ruled out as not actually using "other

approach" category in Table 6.7. As a result, 22 respondents are included in the "other approach" category in Table 6.7.

The free comments on the "other" approach respondents used demonstrate that directors used human resource approach and structural approach more than other approaches. In setting goals for change, they empowered people, and focused on communication, listening, and dialog with staff. At the same time, they used structural approach. They used strategic planning, and clarified roles of individuals while setting goals for change.

Dependent Variables

Table 6.7 displays descriptive statistical results of the dependent variables used in the analysis. The dependent variable is the directors' approaches to setting goals for change. It is composed of three main categories: (1) single approaches; (2) dual approaches; and (3) multiple approaches. The single approaches consist of two subcategories: (1) structural; and (2) human resource.

Table 6.7: Approaches Used in Response to Question 11: How Would You Set Goals for Change if You Were Colin? (N = 455)

Approaches Used	No. of Responses	(%)
SINGLE APPROACHES		
STRUCTURAL		
▪ Keep change efforts headed in the right direction	13	(2.9)
HUMAN RESOURCE		
▪ Keep people involved and communication open	13	(2.9)
POLITICAL		
▪ Provide opportunity for individuals and groups to express their concerns	0	(0)
SYMBOLIC		
▪ Develop shared values	0	(0)
OTHER		
▪ Use a completely different approach	0	(0)
Total Responses	26	(5.7)
DUAL APPROACHES		
▪ Human resource and symbolic	11	(2.4)
▪ Political and symbolic	8	(1.8)
Total Responses	19	(4.2)
MULTIPLE APPROACHES		
▪ Structural, human resource, political, and symbolic	340	(74.7)
▪ Structural, human resource, political, symbolic, and other	19	(4.2)
▪ Structural, human resource, and political	5	(1.1)
▪ Structural, human resource, and symbolic	2	(0.4)
▪ Structural, human resource, and other	1	(0.2)
▪ Structural, political, and symbolic	1	(0.2)
▪ Human resource, political, and symbolic	40	(8.8)
▪ Human resource, symbolic, and other	2	(0.4)
Total Responses	410	(90.1)

Legend: No. Number

Results of Bivariate Crosstabulation and χ^2 Test

The bivariate cross-tabulation indicated that there were many significant associations between the independent variables and the directors' approaches to setting goals for change (Table 6.8). The chi-square test was used to check whether two nominal variables are independent from or related to each other (Sarantakos 2005, 385). The

collected continuous variables were recoded as the categorical ones. The ordinal variables with more categories were also recoded for the sake of reliable results. Results indicated that demographics, human capital, and library characteristics could be used to predict respondents' approaches to setting goals for change.

In Table 6.8, the χ^2 test displayed the statistically significant relationship between gender and approaches to setting goals for change at the .05 level. The minimum expected count is 8.39. Thus, the result can be trusted. The results show that females were more likely than males to use dual and multiple approaches to set goals for change. This supports the hypothesis that females are more likely than males to use the multi-frame approach.

Those who worked for a master-granting college or university were more likely to use the multi-frame approach. The χ^2 test shows that there was a significant relationship between directors' approaches to setting goals for change and library type at the .05 level. The minimum expected count is 4.72. It is close to 5.0. The result might be trusted.

The χ^2 tests did not demonstrate any statistically significant relationships between directors' approaches used and these predictors: age, education level, and library size at the .10 level. However, the percentage results display that directors who were 25 to 39 used multiple approaches more, while directors who were 40 to 59 used single approaches more. Those who obtained MLS employed the multi-frame approach more. Those who worked for a college or university with less than 10,000 total student enrollment utilized the multi-frame approach more, while those who worked for a college

or university with 20,000 or more used dual approaches more to set goals for change.

In Table 6.8 (continued) below, the χ^2 tests did not detect any significant relationships between directors' approaches used and these variables: years at present position and total years of directorship at the .10 level. However, the percentage result shows that directors who had been in their current positions for ten or more years used the multi-frame approach more. Those who had been in all directorship for five to nine years used the single approach more to set goals for change, while those for ten to fourteen years employed multiple approaches more.

According to the result of the χ^2 test, there was no significant relationship between directors' approaches used and total years of library service at the .10 level. However, the percentage results demonstrate that directors who served in libraries for thirty or more years employed dual and multiple approaches more, while those for fewer than one year to fourteen years used single approaches more to set goals for change.

The result of the χ^2 test displays that there was a significant connection between directors' approaches used and number of different positions at the .05 level. The minimum expected count is below 5.0. The result cannot be trusted. However, the percentage results show that those who held one to three different positions used the multi-frame approach more, while those who held seven or more different positions employed dual approaches more.

According to the results of the χ^2 tests, there were no statistically significant relationships between directors' approaches used and these predictors: number of

subordinates and number of library branches at the .10 level. However, the percentage results display that directors who oversaw twenty to twenty-nine subordinates employed the multi-frame approach more to set goals for change, while those who oversaw thirty or more subordinates used single and dual approaches more. Those who did not oversee any library branch employed the multi-frame approach more, while those who oversaw two branches or more used single and dual approaches more to set goals for change.

Table 6.8: Percentage Distribution of Directors' Attitudes toward Approaches Used to Set Goals for Change (N = 455)

	Approaches Used (%)				
	Single	Dual	Multiple	Total	No.
Gender					
Female	3.1	5.1	91.7	100.0	(254)
Male	9.0	3.0	88.1	100.0	(201)
$\chi2$ = 8.009, df = 2, p = .018					
Age					
25–39	3.8	0	96.2	100.0	(26)
40-59	61.5	4.6	89.8	100.0	(283)
60 or more	6.2	4.1	89.7	100.0	(146)
$\chi2$ = 1.530, df = 4, p = .821					
Education Level					
MA/MS not in Library Science & Other	11.1	0	88.9	100.0	(18)
MLS	4.0	4.0	92.1	100.0	(177)
MLS plus other master's degree	4.3	3.7	91.9	100.0	(161)
PhD	10.1	6.1	83.8	100.0	(99)
$\chi2$ = 8.000, df = 6, p = .238					
Type of Institution					
Baccalaureate-granting	4.4	6.2	89.4	100.0	(113)
Master-granting	3.2	1.6	95.1	100.0	(185)
Doctoral-granting	9.6	5.7	84.7	100.0	(157)
$\chi2$ = 12.294, df = 4, p = .015					
Total Student Enrollment					
<10,000	5.5	2.7	91.8	100.0	(329)
10,000–19,999	6.2	7.7	86.2	100.0	(65)
20,000 or more	6.6	8.2	85.2	100.0	(61)
$\chi2$ = 6.429, df = 4, p = .169					
Total	5.7	4.2	90.1	100.0	
No.	(26)	(19)	(410)	(455)	

Legend: No. = Number

Table 6.8 (continued)

	Approaches Used (%) Single	Dual	Multiple	Total	No.
Years of Present Position					
0 - 4	5.4	5.4	89.2	100.0	(167)
5 - 9	6.9	5.6	87.5	100.0	(144)
10 or more	4.9	1.4	93.8	100.0	(144)
$\chi 2$ 4.855, df 4, p .303					
Years of All Directorship					
0 - 4	5.6	7.4	87.0	100.0	(108)
5 - 9	8.7	5.2	86.1	100.0	(115)
10 - 14	3.8	2.5	93.7	100.0	(79)
15 or more	4.6	2.0	93.5	100.0	(153)
$\chi 2$ 8.580, df 6, p .199					
Years of Library Services					
0 - 14	8.9	1.8	89.3	100.0	(56)
15 - 29	6.4	3.5	90.1	100.0	(172)
30 or more	4.4	5.3	90.3	100.0	(227)
$\chi 2$ 3.469, df 4, p .483					
Number of Different Positions					
0 - 3	5.9	2.0	92.2	100.0	(153)
4 - 6	6.3	2.9	90.8	100.0	(207)
7 or more	4.2	10.5	85.3	100.0	(95)
$\chi 2$ 12.611, df 4, p .013					
Number of Subordinates					
1 - 9	5.5	2.3	92.2	100.0	(128)
10 - 19	4.1	4.1	91.9	100.0	(123)
20 - 29	4.6	1.5	93.8	100.0	(65)
30 or more	7.9	7.2	84.9	100.0	(139)
$\chi 2$ 7.685, df 6, p .262					
Number of Library Branches					
0	3.0	4.3	92.7	100.0	(164)
1	6.6	3.6	89.8	100.0	(167)
2 or more	8.1	4.8	87.1	100.0	(124)
$\chi 2$ 3.977, df 4, p .409					
Total	5.7	4.2	90.1	100.0	
No.	(26)	(19)	(410)	(455)	

Legend: No. Number

Results of Correlations

As shown in Table 6.9 below, there are many significant bivariate correlations among variables used in the analysis.

Correlations between Independent Variables and Dependent Variables

The results of this study coincided with two hypotheses presented earlier regarding the use of multiform approaches (Table 6.9). However, calculated r values for the variables were < .30, making the correlations very weak or low rather than moderate or strong. In this study, years at present position and total years of directorship were respectively detected to be positively and significantly correlated with the use of multiple approaches. Directors who were in their current positions or all directorship for longer periods of time were more likely to use multiple approaches to set goals for change than their counterparts. However, the study results did not coincide with other hypotheses. Significant and negative correlations were noted for directors who were males, or had higher education levels, or oversaw more subordinates, or worked at a large school or library in addition to working at universities with higher enrollment.

Male and library type were respectively detected to be negatively and significantly correlated with the use of dual and multiple approaches. Directors who were males, or worked at a large school or library, were more likely than their counterparts to use dual and multiple approaches when setting goals for change.

There were many significant correlations between the independent variables and the approaches to setting goals for change. The structural approach was more likely to be

used by directors overseeing more library branches. However, negative correlations were noted for directors who had been in directorship, or served in libraries for longer periods of time.

The human resource approach was more likely to be used by directors who were males, or had higher education levels, or oversaw more subordinates, or worked at a large school or library. The single approach was more likely to be used by directors who were males, or worked at a large school or library. Directors who served in libraries for longer periods of time, or held more different positions, or oversaw more subordinates, or worked at universities with higher enrollment were found to be more likely than their counterparts to use dual approaches to set goals for change. However, negative correlations were noted for directors who had been in their current positions, or all the directorship for longer periods of time.

Table 6.9: Correlation Matrix for Variables Used in the Analysis (N = 455)

Approaches to Setting Goals for Change

	A	B	C	D	E	F
1	.007	.166****	.124***	-.053	-.061*	-.124***
2	-.015	.035	.014	.043	-.040	-.014
3	-.043	.111***	.049	.049	-.071*	-.049
4	.007	-.040	-.024	-.088**	.077*	.024
5	-.065*	-.012	-.055	-.127***	.128***	.055
6	-.084**	.001	-.060	.072*	-.002	.060
7	-.037	-.037	-.053	.106**	-.030	.053
8	-.024	.087**	.045	.083**	-.091**	-.045
9	.082**	-.020	.045	-.006	-.031	-.045
10	.013	.116***	.093**	.002	-.074*	-.093**
11	-.018	.027	.007	.087**	-.064*	-.007

Notes: A=Structural, B=Human Resource, C=Single, D=Dual, E=Multiple,
F=Single Approaches vs. Dual & Multiple Approaches
1=Male, 2=Age, 3=Education, 4=Years at Present Position, 5=Total Years of Directorship,
6=Total Years of Library Service, 7=No. of Different Positions, 8=No. of Subordinates,
9=No. of Library Branches, 10=Library Type, 11=Library Size
*$p \leq 0.10$; **$p \leq 0.05$; ***$p \leq 0.01$; ****$p \leq 0.001$

Results of Multinomial and Binary Logistic Regressions

The hypotheses of this study focus on directors' use of multiple approaches versus single approaches. Thus, "single approaches" is used as the reference category. Table 6.10 reports the multinomial logistic regression estimates that predict directors' approaches to setting goals for change. The estimated pseudo R^2 displays that this set of variables/subscales explains 18.9% of the variation in directors' approaches to setting

goals for change. The results show that independent variables—male, total years of library service, library type, and total years of directorship—significantly influence the outcome variables.

Male was detected to be negatively and significantly related to the use of single approaches versus dual approaches. Males would be about 74% less likely than females to use dual approaches rather than single approaches to set goals for change.

The relationship between total years of library service and the use of single approaches versus dual approaches was detected to be positive and significant. Each additional year in library service increased the likelihood by 10.2% of using dual approaches rather than single approaches. Those who served in libraries for longer periods of time would be more likely to use dual approaches than those who served for shorter periods of time.

There was a negative and significant relationship between library type and the use of single approaches versus dual approaches. Each additional level in library type decreased the likelihood by 68.5% of using dual approaches rather than single approaches. Those who worked for a higher academic degree college or university would be less likely to use dual approaches than those who worked in a lower academic degree college or university.

A significant and negative relationship between male and the use of single approaches versus multiple approaches was detected. Males would be about 65% less likely than females to use multiple approaches to set goals for change. This supports the

hypothesis that females are more likely than males to use the multi-frame approach.

Total years of directorship was detected to be positively and significantly related to the use of single approaches versus multiple approaches. Each additional year of directorship increased the likelihood of using multiple approaches by 7.2%. For longer periods of time in directorship directors had been, the more likely they would be to use multiple approaches rather than single approaches. This supports the hypothesis that directors who have been in directorship for longer periods of time are more likely than their counterparts to use the multi-frame approach than any other type of approach when dealing with change.

There was a significant and negative relationship between library type and the use of single approaches versus multiple approaches. Each additional level in library type decreased the likelihood of using multiple approaches by 46.7%. This indicates that those who worked for a higher academic degree college or university would be less likely to use multiple approaches than their counterparts. This rejects the hypothesis that directors who work at the research schools are more likely than their counterparts to use the multi-frame approach than any other type of approach when dealing with change.

The relationship between library size and the use of single approaches versus dual approaches was detected to be marginally significant if the sample size were larger. This was also true for the relationship between age and the directors' use of multiple approaches (significance near .10). The other variables might not have any significant impact of the directors' approaches used (significance far from .10).

Binary logistic regression was used to check whether the results would change. Table 6.11 lists binary logistic regression estimates that predict directors' approaches to setting goals for change. The estimated pseudo R^2 shows that this set of variables/subscales explains 11.8% of the variation in the directors' approaches to setting goals for change. Results indicate that the predictors of male, total years of directorship, and library type still demonstrated significant impact on the outcome variables. However, the predictors of total years of library service and library type did not significantly influence respondents' approaches used.

Table 6.10: Multinomial Logistic Regression Estimates Predicting Approaches to Setting Goals for Change (N = 455)

	Dual Approaches vs. Single Approaches		Multiple Approaches vs. Single Approaches	
Predictors	*B*	exp(*B*)	*B*	exp(*B*)
Male	-1.328*	.265	-1.054**	.349
	(.688)		(.457)	
Age	-.100	.905	-.228	.796
	(.313)		(.170)	
Education Level	.211	1.234	-.179	.836
	(.286)		(.194)	
Years of Present Position	-.041	.960	-.022	.978
	(.068)		(.037)	
Total Years of Directorship	-.083	.921	.069*	1.072
	(.064)		(.037)	
Total Years of	.097**	1.102	.018	1.018
Library Service	(.050)		(.028)	
No. of Different	.162	1.176	.100	1.106
Positions	(.131)		(.107)	
No. of	.227	1.255	-.050	.952
Subordinates	(.311)		(.209)	
No. of Library	-.112	.894	-.056	..945
Branches	(.118)		(.062)	
Library Type	-1.154**	.315	-.630*	.533
	(.517)		(.359)	
Library Size	.676	1.967	.373	1.452
	(.438)		(.326)	
Constant	-1.339		5.195****	
	(2.164)		(1.327)	
-2 log likelihood		305.7		
Model χ^2		49.2		
Pseudo R^2		.189		
Df		22		
N		455		

Notes: The *B* is the logistic regression coefficient; exp (*B*) or odds ratio is the antilog of *B*; and standard errors are in parentheses.
*p < 0.10; **p < 0.05; ***p < 0.01; ****p < 0.001

Table 6.11: Binary Logistic Regression Estimates Predicting Approaches to Setting Goals for Change (N = 455)

	Dual & Multiple Approaches vs. Single Approaches	
Predictors	*B*	exp(*B*)
Male	-.1.066**	.344
	(.456)	
Age	-.222	.801
	(.169)	
Education Level	-.163	.850
	(.193)	
Years of Present Position	-.022	.978
	(.037)	
Total Years of Directorship	.064*	1.066
	(.036)	
Total Years of Library Service	.021	1.021
	(.028)	
No. of Different Positions	.104	1.110
	(.107)	
No. of Subordinates	-.036	.965
	(.209)	
No. of Library Branches	-.060	.942
	(.062)	
Library Type	-.653*	.520
	(.358)	
Library Size	.399	1.490
	(.326)	
Constant	2.095****	3.273
	(1.318)	
-2 log likelihood		179.8
Model χ^2		19.5
Pseudo R^2		.118
Df		11
N		455

Notes: The *B* is the logistic regression coefficient; exp (*B*) or odds ratio is the antilog of *B*; and standard errors are in parentheses.

*p < 0.10; **p < 0.50; ***p < 0.01; ****p < 0.001

Taking into account the independent variables used in this study, Table 6.12 reports on the multinomial logistic regression estimates that predict the directors' approaches to setting goals for change. The structural approach was the reference category. The estimated pseudo R^2 displays that this set of variables/subscales explains 25.2% of the variation of the directors' approaches to setting goals for change. Results show that independent variables, such as male, years of present positions, total years of directorship, total years of library service, and number of library branches, significantly influence directors' approaches used.

Male was detected to be positively and significantly related to the use of the structural approach versus the human resource approach. Males would be about 2.9 times as likely as females to use the human resource approach rather than the structural approach. However, male did not impact directors' approaches used in terms of structural approach versus dual, and multiple approaches.

There was a negative and significant relationship between total years of present position and the use of the structural approach versus the human resource approach. Each additional year in present position decreased the likelihood by 12.0% that directors would use the human resource approach rather than structural approach. Directors who had been in their current positions for longer periods of time would be less likely to use human resource approach than their counterparts.

Total years of library service was detected to be positively and significantly related to the use of the structural approach versus dual approaches. Each additional year

in all library services increased the likelihood by 13.7% in using two approaches rather than the structural approach. Directors who served in libraries for longer periods of time would be more likely to use dual approaches to set goals for change than their counterparts.

There was a negative and positive relationship between number of library branches and the use of the structural approach versus dual approaches. Each additional number of library branches decreased the likelihood by 19.5% of using dual approaches rather than the structural approach. The more library branches directors oversaw, the less likely they would be to use dual approaches to set goals for change than their counterparts.

Total years of present position was detected to be negatively and significantly related to the use of the structural approach versus multiple approaches. Each additional year in a current position decreased the likelihood of using multiple approaches rather than the structural approach by 0.9%. Directors who had been in their current positions for longer periods of time would be less likely to use multiple approaches than their counterparts. This rejects the hypothesis that directors who have been in their current positions for longer periods of time are more likely than their counterparts to use the multi-frame approach while managing change.

There was a significant and positive relationship between total years of directorship and the use of the structural approach versus multiple approaches. Those who had been in directorship for longer periods of time would be more likely to use the

multi-frame approach rather than the structural approach when setting goals for change. For each additional year of directorship, this likelihood increased 12.8%. This confirms the hypothesis that directors who have been in directorship for longer periods of time are more likely to use multiple approaches than their counterparts.

The relationship between number of library branches and the use of the structural approach versus multiple approaches was detected to be negative and significant. Each additional number of library branches decreased the likelihood by 14.5% of using multiple approaches rather than the structural approach. The more library branches directors oversaw, the less likely they would be to use multiple approaches to set goals for change than their counterparts.

In terms of using the structural approach versus the human resource approach, number of branch was detected to be a marginally significant predictor (significance close to .10). This was also true for the relationship between library size and the use of the structural approach versus dual approaches. However, the results of other variables did not significantly impact the directors' approaches used (significance far from .10).

Table 6.12: Multinomial Logistic Regression Estimates Predicting Approaches to Setting Goals for Change (N = 455)

	Human Resource vs. Structural		Dual vs. Structural		Multiple vs. Structural	
Predictors	*B*	exp(*B*)	*B*	exp(*B*)	*B*	exp(*B*)
Male	.287*	2.850	-.562	.570	-.320	.762
	(.218)		(.799)		(.606)	
Age	-.083	.920	-.111	.895	-.240	.787
	(.336)		(.344)		(.221)	
Education	.624	1.866	.530	1.699	.139	1.149
	(.405)		(.358)		(.289)	
Years of Present Position	-.127*	.880	-.113	.893	-.095*	.910
	(.074)		(.077)		(.051)	
Total Years of Directorship	.069	1.071	-.032	.968	.120**	1.128
	(.076)		(.080)		(.061)	
Total Years of Library Service	.070	1.073	.129**	1.137	.049	1.050
	(.056)		(.055)		(.035)	
No. of Different Positions	-.166	.847	.102	1.108	.040	1.041
	(.208)		(.150)		(.130)	
No. of Subordinates	.341	1.406	.406	1.501	.130	1.139
	(.427)		(.380)		(.303)	
No. of Library Branches	-.400	.670	-.217*	.805	-.157**	.855
	(.245)		(.126)		(.072)	
Library Type	.766	2.151	-.842	.431	-.323	.724
	(.746)		(.596)		(.464)	
Library Size	.573	1.773	.985	2.679	.676	1.965
	(.700)		(.638)		(.565)	
Constant	-7.230**		-3.868		2.697	
	(2.918)		(2.456)		(1.740)	
-2 log likelihood				319.4		
Model χ^2				71.6		
Pseudo R^2				.252		
df				33		
N				455		

Notes: The *B* is the logistic regression coefficient; exp (*B*) or odds ratio is the antilog of *B*; and standard errors are in parentheses.
*p < 0.10; **p < 0.50; ***p < 0.01; ****p < 0.001.

Approaches to Resolving Conflict

Question 12. How would you approach conflict resulting from Ken's supporters?

Descriptive Results

Table 6.13 below displays that 54.7% directors would use dual approaches to resolve conflict resulting from Ken's supporters. Of all the respondents, 23.3% would use multiple approaches. The total single approaches would be used by 22.0% of all respondents. No respondent would use the single political approach to resolve conflict. No respondent checked N/A (not applicable) for each response.

The structural and human resource approaches were favored by directors choosing dual or multiple approaches. Most likely, these approaches appear together more often over the others because directors spend much of their time working with a variety of people and realigning roles and duties of staff in current academic libraries that are caught up in the mode of rapidly changing technology.

The "other" approach was noted by 43 (9.5%) respondents. Of these respondents, 17 commented on the "other" approach they would use. However, no respondent listed a true "other" approach. According to the Bolman and Deal's model, five responses were actually the structural approach; two, human resources; one, political; two symbolic; three, dual approach; and four comments. The remaining 26 respondents did not specify what their other approaches were and therefore could not be ruled out as not actually

using "other approach" category in Table 6.13. As a result, 26 respondents are included in the "other approach" category in Table 6.13.

The free comments on the "other" approach respondents used indicate that directors used the structural approach more than other approaches. They focused on the shared goals and responsibilities while resolving conflict.

Dependent Variables

Table 6.13 demonstrates descriptive statistical results of the dependent variables used in the analysis. The dependent variable is the directors' approaches to resolving conflict. It consists of three main categories: (1) single approaches; (2) dual approaches; and (3) multiple approaches. The single approaches have four subcategories: (1) structural; (2) human resource; (3) symbolic; and (4) other.

Table 6.13: Approaches Used in Response to Question 12: How Would You Approach Conflict Resulting from Ken's Supporters? (N = 455)

Approaches Used	No. of Responses	(%)
SINGLE APPROACHES		
STRUCTURAL		
▪ Maintain change goals by having authorities resolve conflict	10	(2.2)
HUMAN RESOURCE		
▪ Develop relationships by having individuals confront conflict	20	(4.4)
POLITICAL		
▪ Develop power by bargaining, and forcing others to win	0	(0)
SYMBOLIC		
▪ Develop shared values and use conflict to negotiate meaning	60	(13.2)
OTHER		
▪ Use a completely different approach	10	(2.2)
Total Responses	100	(22.0)
DUAL APPROACHES		
▪ Structural and human resource	11	(2.4)
▪ Structural and symbolic	18	(4.0)
▪ Structural and other	1	(0.2)
▪ Human resource and political	2	(0.4)
▪ Human resource and symbolic	201	(44.2)
▪ Human resource and other	1	(0.2)
▪ Political and symbolic	10	(2.2)
▪ Symbolic and other	5	(1.1)
Total Responses	249	(54.7)
MULTIPLE APPROACHES		
▪ Structural, human resource, political, and symbolic	14	(3.1)
▪ Structural, human resource, and political	3	(0.7)
▪ Structural, human resource, and symbolic	48	(10.5)
▪ Structural, human resource, and other	1	(0.2)
▪ Structural, political, and symbolic	3	(0.7)
▪ Human resource, political, and symbolic	29	(6.4)
▪ Human resource, symbolic, and other	8	(1.8)
Total Responses	106	(23.3)

Legend: No. Number

Results of Bivariate Crosstabulation and χ^2 Test

The bivariate cross-tabulation indicated that there were many significant associations between the independent variables and the directors' approaches to resolving conflict (Table 6.14). The chi-square test was used to check whether two nominal variables are independent from or related to each other (Sarantakos 2005, 385). The collected continuous variables were recoded as the categorical ones. The ordinal variables with more categories were also recoded for the sake of reliable results. Results indicated that demographics, human capital, and library characteristics could be used to predict respondents' approaches to resolving conflict.

In Table 6.14 below, the χ^2 tests did not detect any significant relationships between directors' approaches used and these variables: gender, age, education level, and library type at the .10 level. However, the percentage results show that females used single approaches more often than men, while males employed the multi-frame approach more. Directors who were 25 to 39 employed dual and multiple approaches more. Those who obtained PhD used the multi-frame approach more, while those who got MLS plus other master's degree utilized dual approaches more. Those who worked for a baccalaureate-granting college or university used the single and dual approaches more, while those who worked for a doctoral-granting college or university utilized the multi-frame approach more.

The χ^2 test did not demonstrate any statistically significant connection between directors' approaches used and library size at the .10 level. However, the percentage

results display that those who worked for a college or university with less than 10,000 total student enrollment used dual approaches more, while those who worked for a college or university with 20,000 or more employed multiple approaches more to resolve conflict.

In Table 6.14 (continued) below, the χ^2 tests did not detect any significant relationships between directors' approaches used and these predictors at years at present position, total years of directorship, and total years of library service at the .10 level. However, the percentage results show that directors who had been in their current positions for five to nine years used the multi-frame approach more, while those for fewer than one year to four years employed dual approaches more. Those who had been in all directorship for fewer than one year to four years utilized dual approaches more, while those for ten to fourteen years used multiple approaches more. Directors who served in libraries for fewer than one year to fourteen years utilized dual and multiple approaches more, while those for thirty years or more used single approaches more than their counterparts.

The result of the χ^2 test displays that there was no significant connection between directors' approaches used and number of different positions at the .10 level. However, the percentage results demonstrates that those who held one to three different positions used the single approach more, while those who held four to six different positions employed dual approaches more. Those who held seven or more different positions used the multi-frame approach more.

According to the result of the χ^2 tests, there were not any statistically significant relationships between directors' approaches used and these predictors: number of subordinates and number of library branches at the .10 level. However, the percentage results display that directors who oversaw ten to nineteen subordinates used the single and multi-frame approach more, while those who oversaw twenty to twenty-nine subordinates used dual approaches more. Those who oversaw two or more library branches used the multi-frame approach more, while those who oversaw one branch utilized single approaches more.

Table 6.14: Percentage Distribution of Directors' Attitudes toward Approaches Used to Resolve Conflict (N = 455)

	Approaches Used (%)				
	Single	Dual	Multiple	Total	No.
Gender					
Female	23.6	54.7	21.7	100.0	(254)
Male	19.9	54.7	25.4	100.0	(201)
$\chi2$ = 1.373, df = 2, p = .503					
Age					
25–39	7.7	61.5	30.8	100.0	(26)
40-59	21.9	56.2	21.9	100.0	(283)
60 or more	24.7	50.7	24.7	100.0	(146)
$\chi2$ = 4.631, df = 4, p = .327					
Education Level					
MA/MS not in Library Science & Other	27.8	50.0	22.2	100.0	(18)
MLS	23.7	55.4	20.9	100.0	(177)
MLS plus other master's degree	18.6	57.8	23.6	100.0	(161)
PhD	23.2	49.5	27.3	100.0	(99)
$\chi2$ = 3.388, df = 6, p = .759					
Type of Institution					
Baccalaureate-granting	23.9	60.2	15.9	100.0	(113)
Master-granting	21.6	54.6	23.8	100.0	(185)
Doctoral-granting	21.0	51.0	28.0	100.0	(157)
$\chi2$ = 5.446, df = 4, p = .245					
Total Student Enrollment					
<10,000	21.9	56.2	21.9	100.0	(329)
10,000–19,999	21.5	53.8	24.6	100.0	(65)
20,000 or more	23.0	47.5	29.5	100.0	(61)
$\chi2$ = 2.094, df = 4, p = .718					
Total	22.0	54.7	23.3	100.0	
No.	(100)	(249)	(106)	(455)	

Legend: No. = Number

Table 6.14 (continued)

	Approaches Used (%) Single	Dual	Multiple	Total	No.
Years of Present Position					
0 - 4	18.6	59.9	21.6	100.0	(167)
5 - 9	21.5	51.4	27.1	100.0	(144)
10 or more	26.4	52.1	21.5	100.0	(144)
χ^2 = 4.758, df = 4, p = .313					
Years of All Directorship					
0 - 4	18.5	58.3	23.1	100.0	(108)
5 - 9	25.2	50.4	24.3	100.0	(115)
10 - 14	21.5	53.2	25.3	100.0	(79)
15 or more	22.2	56.2	21.6	100.0	(153)
χ^2 = 2.279, df = 6, p = .892					
Years of Library Services					
0 - 14	14.3	51.8	33.9	100.0	(56)
15 - 29	22.1	54.7	23.3	100.0	(172)
30 or more	23.8	55.5	20.7	100.0	(227)
χ^2 = 5.333, df = 4, p = .255					
Number of Different Positions					
0 - 3	25.5	48.4	26.1	100.0	(153)
4 - 6	19.3	58.9	21.7	100.0	(207)
7 or more	22.1	55.8	22.1	100.0	(95)
χ^2 = 4.150, df = 4, p = .386					
Number of Subordinates					
1 - 9	23.4	52.3	24.2	100.0	(128)
10 - 19	24.4	49.6	26.0	100.0	(123)
20 - 29	21.5	61.5	16.9	100.0	(65)
30 or more	18.7	58.3	23.0	100.0	(139)
χ^2 = 4.304, df = 6, p = .636					
Number of Library Branches					
0	22.6	56.1	21.3	100.0	(164)
1	22.8	55.1	22.2	100.0	(167)
2 or more	20.2	52.4	27.4	100.0	(124)
χ^2 = 1.705, df = 4, p = .790					
Total	22.0	54.7	23.3	100.0	
No.	(100)	(249)	(106)	(455)	

Legend: No. = Number

Results of Correlations

As shown in Table 6.15 below, there are many significant bivariate correlations among variables used in the analysis.

Correlations between Independent Variables and Dependent Variables

The results of this study concurred with the hypotheses presented earlier regarding the use of multiple approaches (Table 6.15). However, calculated r values for the variables were < .30, making the correlations very weak or low rather than moderate or strong. In this study, there was no significant association between gender and directors' multiple approaches used. Correlation between library type and the use of multiple approaches were detected to be positive and significant. Directors who worked at a large school or library were more likely to use multiple approaches to resolve conflict than their counterparts. However, the study results did not coincide with other hypotheses. Directors who served in libraries for longer periods of time were less likely to use multiple approaches than their counterparts.

The variables of age, years at present position, and total years of library service were respectively detected to be negatively and significantly correlated with the use of dual and multiple approaches. Directors who were older, or had been in their current positions or library service for longer periods of time were less likely than their counterparts to use dual and multiple approaches to resolve conflict.

There were many significant correlations between the independent variables and the approaches to resolving conflict. The structural approach was more likely to be used

by directors having higher education levels or holding their current positions for longer periods of time.

The human resource approach was more likely to be used by older directors. However, directors who were more educated were found to be less likely than their counterparts to use it to resolve conflict. Directors who had been in their current positions or library service for longer periods of time were more likely than their counterparts to utilize the symbolic approach, while males were less likely than females to do so.

The other approach was more likely to be used by directors who had higher education levels or held more different positions. Directors who were older, or had been in their current positions or library service for longer periods of time were more likely to use single approaches to resolve conflict than their counterparts. Dual approaches were less likely to be used by directors who had been in their current positions for longer periods of time, or worked at a large school or library, or at universities with higher enrollment.

Table 6.15: Correlation Matrix for Variables Used in the Analysis (N = 455)

Approaches to Resolving Conflict

	A	B	C	D	E	F	G	H
1	-.013	.025	-.072*	.018	-.045	.000	.044	.045
2	.050	.092**	.038	.002	.095**	-.040	-.046	-.095**
3	.068*	-.105**	-.027	.108***	-.012	-.035	.052	.012
4	.082**	.054	.063*	.004	.109***	-.071*	-.022	-.109***
5	.042	.000	.041	-.055	.028	-.004	-.024	-.028
6	-.013	.060	.078**	-.057	.068*	.020	-.090**	-.068*
7	-.056	-.021	-.022	.175****	.013	.038	-.058	-.013
8	..003	-.040	-.040	.003	-.050	.064	-.027	.050
9	.053	-.039	.000	.053	.018	-.009	-.007	-.018
10	-.039	-.013	-.007	.001	-.025	-.070*	.107**	.025
11	-.030	-..018	.033	.038	.021	-.061*	.051	-.021

Notes: A=Structural, B=Human Resource, C=Symbolic, D=Other, E=Single, F=Dual, G=Multiple, H=Single Approaches vs. Dual & Multiple Approaches
1=Male, 2=Age, 3=Education, 4=Years at Present Position, 5=Total Years of Directorship, 6=Total Years of Library Service, 7=No. of Different Positions, 8=No. of Subordinates, 9=No. of Library Branches, 10=Library Type, 11=Library Size

Results of Multinomial and Binary Logistic Regressions

The hypotheses of this study focus on directors' use of multiple approaches versus single approaches. Thus, "single approaches" is used as the reference category. Table 6.16 reports the multinomial logistic regression estimates that predict directors' approaches to resolving conflict. The estimated pseudo R^2 displays that this set of variables/subscales explains 7.2% of the variation in directors' approaches to

resolving conflicts during the change process. The results display that independent variables—total years of present position, and library type—significantly impact the outcome variables.

A negative and significant relationship was noted between the total years at the present position and the use of single approaches versus dual approaches. Each additional year at present position decreased the likelihood by 4.5% to use dual approaches. Directors in their current positions for a longer period of time were less likely than their counterparts to use dual approaches to resolve conflict.

Library type was detected to be positively and significantly related to the use of single approaches versus multiple approaches. Each additional level in library type increased the likelihood by 60.1% of using multiple approaches rather than single approaches. Directors who worked at research libraries were more likely to use multiple approaches than those who worked in a lower academic degree college or university. This supports the hypothesis that directors work for a higher academic degree college or university are more likely than their counterparts to use the multi-frame approach while dealing with change.

The relationship between age and the use of dual approaches was detected to be marginally significant (significance near .10). This was also true for the relationship between number of subordinates and the directors' use of dual approaches. The other variables might not have any significant impact of the directors' approaches used (significance far from .10) even if the sample size were larger.

Binary logistic regression was used to check whether the results would change. Table 6.17 show binary logistic regression estimates that predict directors' approaches to resolving conflicts. The estimated pseudo R^2 demonstrates that this set of variables/subscales explains 4.4% of the variation in the directors' approaches to resolving conflict. Results display that the predictor of years at present position still significantly impact on the outcome variables. However, the predictor of library type did not significantly influence respondents' approaches used.

Table 6.16: Multinomial Logistic Regression Estimates Predicting Approaches to Resolving Conflict (N = 455)

	Dual Approaches vs. Single Approaches		Multiple Approaches vs. Single Approaches	
Predictors	*B*	exp(*B*)	*B*	exp(*B*)
Male	.134	1.144	.211	1.235
	(.256)		(.300)	
Age	-.177	.838	-.133	.875
	(.110)		(.124)	
Education Level	-.054	.947	.078	1.081
	(.116)		(.135)	
Years of Present Position	-.046**	.955	-.030	.971
	(.021)		(.024)	
Total Years of Directorship	.029	1.029	.023	1.023
	(.020)		(.023)	
Total Years of	.005	1.005	-.022	.979
Library Service	(.018)		(.020)	
No. of Different	-.003	.997	-.038	.963
Positions	(.047)		(.058)	
No. of	.189	1.209	-.008	.992
Subordinates	(.118)		(.138)	
No. of Library	-.008	.992	-.035	.965
Branches	(.038)		(.049)	
Library Type	-.021	.979	.471**	1.601
	(.196)		(.235)	
Library Size	-.162	.850	-.055	.947
	(.175)		(.194)	
Constant	2.058***		.452	
	(.737)		(.846)	
-2 log likelihood		882.8		
Model χ^2		29.3		
Pseudo R^2		.072		
Df		22		
N		455		

Notes: The *B* is the logistic regression coefficient; exp (*B*) or odds ratio is the antilog of *B;* and standard errors are in parentheses.
*p< 0.10; **p ≤ 0.05; ***p ≤ 0.01; ****p ≤ 0.001

Table 6.17: Binary Logistic Regression Estimates Predicting Approaches to Resolving Conflict (N = 455)

	Dual & Multiple Approaches vs. Single Approaches	
Predictors	*B*	exp(*B*)
Male	.159	1.172
	(.245)	
Age	-.160	.853
	(.105)	
Education Level	-.018	.983
	(.110)	
Years of Present Position	-.041**	.960
	(.019)	
Total Years of Directorship	.027	1.027
	(.019)	
Total Years of Library Service	-.004	.996
	(.017)	
No. of Different Positions	-.013	.987
	(.045)	
No. of Subordinates	.128	1.137
	(.112)	
No. of Library Branches	-.017	.983
	(.036)	
Library Type	.122	1.130
	(.186)	
Library Size	-.116	.891
	(.163)	
Constant	2.207***	9.089
	(.708)	
-2 log likelihood		466.0
Model χ^2		13.2
Pseudo R^2		.044
Df		11
N		455

Notes: The *B* is the logistic regression coefficient; exp (*B*) or odds ratio is the antilog of *B*; and standard errors are in parentheses.

*p < 0.10; **p < 0.50; ***p < 0.01; ****p < 0.001

Table 6.18 below lists the multinomial logistic regression estimates that predict the directors' approaches to resolving conflict. As a reference category, the symbolic approach was used more often than any other single approach. The estimated pseudo R^2 indicates that this set of variables/subscales explains 16.5% of the variation of the directors' approaches to resolving conflicts. Results display that independent variables, such as male, age, education level, total years of library service, number of different professional positions, and library type, significantly impact the outcome variables.

Male was detected to be positively and significantly related to the use of the symbolic approach versus the human resource approach. Males were about 3 times as likely as females to use the human resource approach to resolve conflicts. However, male did not have any significant effect on the use of the symbolic approach versus, structural, other, dual, and multiple approaches.

The relationship between age and the use of the symbolic approach versus the human resource approach was detected to be positive and significant. Each additional level in age increased the likelihood by 72.6% that directors would use the human resource approach rather than the symbolic approach. Older directors would be more likely to use the human resource approach to resolve conflicts than younger directors. Age had no significant effect, however, on the use of the symbolic approach versus structural, other, dual, and multiple approaches.

The relationship between education level and the symbolic approach versus the human resource approach to resolving conflict was detected to be significant and

negative. Each additional level in education decreased the likelihood by 43.4% of using the human resource approach rather than symbolic approach. Those with higher education level would be less likely than their counterparts to use the human resource approach rather than symbolic approach to resolve conflict. Education level was also detected to be statistically positively and significantly related to the use of the symbolic approach versus other approach in resolving conflict. Those with higher education would be 2.3 times as likely as those with less education to use other approaches to handle conflicts during the change process. Schooling had no significant, however, on the use of symbolic approach versus structural, dual, and multiple approaches.

There was a negative and significant relationship between total years of all library service and the use of the symbolic approach versus other approaches. Those who had more years of all library service would be less likely than their counterparts to use the other approach rather than the symbolic approach to resolve conflict. For each additional year of library service, this likelihood decreased 7.9%. Total years of library service was also detected to be negatively and significantly related to the use of the symbolic approach versus multiple approaches. Each additional year in library service decreased the likelihood by 4.9% in using multiple approaches rather than the symbolic approach. This rejects the hypothesis that directors who have been in library services for longer periods of time are more likely to use multiple approaches than their counterparts.

The relationship between the number of different library professional positions and the use of the symbolic approach versus other approach was detected to be positive

and significant. Each additional number in different positions increased the likelihood by 28.1% of using the other approach rather than symbolic approach to resolve conflict. Directors who held more professional positions would be more likely than their counterparts to use other approaches rather than the symbolic approach to resolve conflict.

Library type was detected to be positively and very significantly related to the use of the symbolic approach versus multiple approaches. Each additional level in library type increased the likelihood by 56.4% of using multiple approaches rather than the symbolic approach to handle conflicts. Directors who worked at research libraries would be more likely to use multiple approaches than those who worked in a lower academic degree college or university. This supports the hypothesis that directors who work for a higher academic degree college or university are more likely than their counterparts to use the multi-frame approach while managing change.

In terms of using the symbolic approach versus structural approach, number of branch was a marginally significant predictor (significance close to .10). This was also true for the relationship between total years of directorship and the symbolic approach versus other approach, and the relationship between number of subordinates and the symbolic approach versus dual approaches. However, the results of other variables did not significantly impact the directors' approaches used (significance far from .10).

Table 6.18: Multinomial Logistic Regression Estimates Predicting Approaches to Resolving Conflict (N = 455)

	Structural vs. Symbolic		Human Resource vs. Symbolic		Other vs. Symbolic	
Predictors	*B*	exp(*B*)	*B*	exp(*B*)	*B*	exp(*B*)
Male	-.101	.904	1.093*	2.982	.801	2.228
	(.779)		(.574)		(.788)	
Age	.337	1.401	.546**	1.726	.241	1.272
	(.325)		(.276)		(.311)	
Education	.412	1.510	-.570*	.566	.833**	2.299
	(.315)		(.293)		(.331)	
Years of Present Position	.057	1.058	.023	1.023	.076	1.078
	(.057)		(.046)		(.059)	
Total Years of Directorship	-.034	.967	-.049	.952	-.103	.902
	(.060)		(.045)		(.065)	
Total Years of Library Service	-.057	.945	-.019	.981	-.082*	.921
	(.049)		(.041)		(.046)	
No. of Different Positions	-.071	.932	-.006	.994	.248**	1.281
	(.207)		(.135)		(.098)	
No. of Subordinates	.248	1.281	-.052	.950	-.147	.863
	(.379)		(.258)		(.387)	
No. of Library Branches	.134	1.143	-.166	.847	.100	1.105
	(.089)		(.181)		(.087)	
Library Type	-.349	.706	.124	1.132	-.192	.825
	(.601)		(.420)		(.628)	
Library Size	-771	.462	-.053	.948	-.116	.891
	(.730)		(.378)		(.528)	
Constant	-3.238		-2.294		-5.426**	
	(2.335)		(1.906)		(2.395)	
-2 log likelihood				1055.2		
Model χ^2				74.7		
Pseudo R^2				.165		
df				55		
N				455		

Notes: The *B* is the logistic regression coefficient; exp (*B*) or odds ratio is the antilog of *B*; and standard errors are in parentheses.
*p < 0.10; **p < 0.50; ***p < 0.01; ****p < 0.001

Table 6.18 (continued)

Predictors	Dual vs. Symbolic *B*	exp(*B*)	Multiple vs. Symbolic *B*	exp(*B*)
Male	.366	1.442	.442	1.556
	(.316)		(.353)	
Age	-.009	.991	.034	1.034
	(.136)		(.148)	
Education Level	-.016	.984	.120	1.127
	(.144)		(.160)	
Years of Present Position	-.023	.978	-.006	.994
	(.025)		(.028)	
Total Years of Directorship	.009	1.009	.003	1.003
	(.023)		(.026)	
Total Years of Library Service	-.024	.976	-.051*	.951
	(.024)		(.027)	
No. of Different Positions	.067	1.070	.034	1.035
	(.075)		(.084)	
No. of Subordinates	.191	1.211	-.007	.993
	(.141)		(.158)	
No. of Library Branches	.007	1.007	-.020	.980
	(.048)		(.058)	
Library Type	-.042	.959	.447*	1.564
	(.239)		(.272)	
Library Size	-.249	.779	-.139	.871
	(.202)		(.219)	
Constant	1.820**		.207	
	(.865)		(.963)	
-2 log likelihood		1055.2		
Model χ^2		74.7		
Pseudo R^2		.165		
df		55		
N		455		

Notes: The *B* is the logistic regression coefficient; exp (*B*) or odds ratio is the antilog of *B*; and standard errors are in parentheses.
*p < 0.10; **p < 0.50; ***p < 0.01; ****p < 0.001.

Approaches to Communicating the Public and Staff

Question 13. How would you communicate with the public and your staff if you were Colin?

Descriptive Results

As displayed in Table 6.19 below, 78.7% directors would use multiple approaches to communicate with the public and their staff if they were Colin, while only 10.5% used dual approaches. The total single approaches would only be used by 10.8% of all respondents. No respondent would use the single political, symbolic, or other approach to communicate with the public and staff. No respondent checked N/A (not applicable) for each response.

The structural and human resource approaches were favored by directors choosing dual or multiple approaches. Most likely, these approaches appear together more often over the others because directors spend much of their time working with a variety of people and realigning roles and duties of staff in current academic libraries that are caught up in the mode of rapidly changing technology.

The "other" approach was noted by 27 (5.9%) respondents. Of these respondents, 15 commented on the "other" approach they would use. However, no respondent listed a true "other" approach. According to the Bolman and Deal's model, seven responses were actually the human resource approach; one, political; two, symbolic; one, dual approach; and four, comments. The remaining 12 respondents did not specify what their other approaches were and therefore could not be ruled out as not actually using "other

approach" category in Table 6.19. As a result, 12 respondents are included in the "other approach" category in Table 6.19.

The free comments on the "other" approach respondents used show that directors used the human resource approach more than other approaches. They focused on staff involvement, and listening in the change process.

Dependent Variables

Table 6.19 lists descriptive statistical results of the dependent variables used in the analysis. The dependent variable is the directors' approaches to communicating with the public and staff. It comprises three main categories: (1) single approaches; (2) dual approaches; and (3) multiple approaches. The single approaches are made up of two subcategories: (1) structural; and (2) human resource.

Table 6.19: Approaches Used in Response to Question 13: How Would You Communicate with the Public and Your Staff if You were Colin? (N = 455)

Approaches Used	No. of Responses (%)	
SINGLE APPROACHES		
STRUCTURAL		
▪ Communicate facts and information during the change process	22	(4.8)
HUMAN RESOURCE		
▪ Exchange information and needs during the change process	27	(5.9)
POLITICAL		
▪ View communication as a vehicle for influencing others	0	(0)
SYMBOLIC		
▪ Use stories to communicate a vision to individuals involved in the change process	0	(0)
OTHER		
▪ Use a completely different approach	0	(0)
Total Responses	49	(10.8)
DUAL APPROACHES		
▪ Structural and human resource	21	(4.6)
▪ Structural and political	7	(1.5)
▪ Structural and symbolic	6	(1.3)
▪ Human resource and political	9	(2.0)
▪ Human resource and symbolic	5	(1.1)
Total Responses	48	(10.5)
MULTIPLE APPROACHES		
▪ Structural, human resource, political, and symbolic	243	(53.4)
▪ Structural, human resource, and political	71	(15.6)
▪ Structural, human resource, and symbolic	24	(5.3)
▪ Structural, human resource, political, symbolic, and other	12	(2.6)
▪ Structural, political, and symbolic	4	(0.9)
▪ Human resource, political, and symbolic	4	(0.9)
Total Responses	358	(78.7)

Legend: No. Number

Results of Bivariate Crosstabulation and χ^2 Test

The bivariate cross-tabulation indicated that there were many significant associations between the independent variables and the directors' approaches to communicating with the public and staff (Table 6.20). The chi-square test was used to

check whether two nominal variables are independent from or related to each other (Sarantakos 2005, 385). The collected continuous variables were recoded as the categorical ones. The ordinal variables with more categories were also recoded for the sake of reliable results.

In Table 6.20 below, the χ^2 test did not demonstrate any significant relationship between directors' approaches and gender at the .10 level. However, the percentage result displays that females employed single and dual approaches more than males. Compared with females, males used the multi-frame approach more to communicate with the public and staff.

The χ^2 tests did not show any significant connection between directors' approaches used and these predictors: age, education level, library type, and library size at the .10 level. However, the percentage results display that directors who were forty to fifty-nine employed multiple approaches more, while directors who were sixty years or more used dual approaches more. Those who obtained MA/MS not in library science and other employed the single and multi-frame approach more, while those who got MLS utilized dual approaches more. Those who worked for a baccalaureate-granting college or university used dual approaches more, while those who worked for a master-granting college or university employed the multi-frame approach more. Those who worked for a college or university with less than 10,000 total student enrollment used the multi-frame approach more, while those who worked for a college or university with 20,000 or more student enrollment used the single and multiple approaches more.

In Table 6.20 (continued) below, the χ^2 test did not detect any significant relationship between directors' approaches to communicating with the public and staff and total years of present position. However, the percentage result shows that directors who had been in their current positions for fewer than one year to four years used the single approach more, while those for ten years or more used the multi-frame approach more.

According to the results of the χ^2 tests, there were no significant relationships between directors' approaches used and these variables: total years of directorship, total years of library service, number of different positions, number of subordinates, and number of library branches at the .10 level. However, the percentage results display that those who had been in all directorship for fewer than one year to four years used the single approach more, while those for ten to fourteen years used multiple approaches more. Directors who served in libraries for fewer than one year to fourteen years used single approaches more, while those for fifteen to twenty-nine used multiple approaches more. Those who held four to six different positions were more likely to use the multi-frame approach, while those who held one to three different positions used dual approaches more. Directors who oversaw ten to nineteen subordinates used the multi-frame approach more, while those who oversaw one to nine subordinates employed single and dual approaches more. Those who oversaw two or more library branches utilized dual and multiple approaches more.

Table 6.20: Percentage Distribution of Directors' Attitudes toward Approaches Used to Communicate with the Public and Staff (N = 455)

	Approaches Used (%)				
	Single	Dual	Multiple	Total	No.
Gender					
Female	11.0	11.4	77.6	100.0	(254)
Male	10.4	9.5	80.1	100.0	(201)
$\chi2$ = .537, df = 2, p = .764					
Age					
25–39	15.4	7.7	76.9	100.0	(26)
40-59	9.9	10.6	79.5	100.0	(283)
60 or more	11.6	11.0	77.4	100.0	(146)
$\chi2$ = 1.110, df = 4, p = .893					
Education Level					
MA/MS not in Library Science & Other	16.7	0.0	83.3	100.0	(18)
MLS	9.0	13.6	77.4	100.0	(177)
MLS plus other master's degree	11.2	8.7	80.1	100.0	(161)
PhD	12.1	10.1	77.8	100.0	(99)
$\chi2$ = 5.368, df = 6, p = .498					
Type of Institution					
Baccalaureate-granting	8.0	15.0	77.0	100.0	(113)
Master-granting	10.3	8.1	81.6	100.0	(185)
Doctoral-granting	13.4	10.2	76.4	100.0	(157)
$\chi2$ = 5.432, df = 4, p = .246					
Total Student Enrollment					
<10,000	9.4	10.3	80.2	100.0	(329)
10,000–19,999	10.8	10.8	78.5	100.0	(65)
20,000 or more	18.0	11.5	70.5	100.0	(61)
$\chi2$ = 4.232, df = 4, p = .376					
Total	10.8	10.5	78.7	100.0	
No.	(49)	(48)	(358)	(455)	

Legend: No. Number

Table 6.20 (continued)

	Approaches Used (%)				
	Single	Dual	Multiple	Total	No.
Years of Present Position					
0 - 4	12.0	9.0	79.0	100.0	(167)
5 - 9	11.8	11.8	76.4	100.0	(144)
10 or more	8.3	11.1	80.6	100.0	(144)
$\chi 2$ 1.973, df 4, p .741					
Years of All Directorship					
0 - 4	14.8	9.3	75.9	100.0	(108)
5 - 9	12.2	10.4	77.4	100.0	(115)
10 - 14	6.3	10.1	83.5	100.0	(79)
15 or more	9.2	11.8	79.1	100.0	(153)
$\chi 2$ 4.439, df 6, p .617					
Years of Library Services					
0 - 14	17.9	7.1	75.0	100.0	(56)
15 - 29	9.3	11.0	79.7	100.0	(172)
30 or more	10.1	11.0	78.9	100.0	(227)
$\chi 2$ 3.862, df 4, p .425					
Number of Different Positions					
0 - 3	11.1	11.1	77.8	100.0	(153)
4 - 6	9.2	10.1	80.7	100.0	(207)
7 or more	13.7	10.5	75.8	100.0	(95)
$\chi 2$ 1.552, df 4, p .817					
Number of Subordinates					
1 9	13.3	14.8	71.9	100.0	(128)
10 - 19	8.9	8.9	82.1	100.0	(123)
20 - 29	9.2	10.8	80.0	100.0	(65)
30 or more	10.8	7.9	81.3	100.0	(139)
$\chi 2$ 5.803, df 6, p .446					
Number of Library Branches					
0	10.4	8.5	81.1	100.0	(164)
1	12.6	10.2	77.2	100.0	(167)
2 or more	8.9	13.7	77.4	100.0	(124)
$\chi 2$ 2.961, df 4, p .564					
Total	10.8	10.5	78.7	100.0	
No.	(49)	(48)	(358)	(455)	

Legend: No. Number

Results of Correlations

Table 6.21 below reports the results of bivariate correlations among variables used in the analysis.

Correlations between Independent Variables and Dependent Variables

The results of this study coincided with the hypotheses presented earlier regarding the use of multiple approaches (Table 6.21). However, calculated r values for the variables were < .30, making the correlations very weak or low rather than moderate or strong. In this study, there was no significant association between gender and directors' multiple approaches used. Correlation between number of subordinates and the use of multiple approaches were detected to be positive and significant. Directors who oversaw more subordinates were more likely to use multiple approaches to communicate with the public and staff than their counterparts. However, the study results contradicted other hypotheses. Directors who worked at universities with higher enrollment were less likely to utilize the multi-frame approach to communicate with the public and staff than their counterparts.

Years at present position was positively and significantly correlated with the use of dual and multiple approaches. Directors who had been in their current positions for longer periods of time were more likely than their counterparts to use dual and multiple approaches to communicate with the public and staff. However, the correlations between the type and size of libraries and the use of dual and multiple approaches were detected to be negative and significant. Directors who worked at a large school or library, or at

universities with higher enrollment were less likely than their counterparts to use dual and multiple approaches.

The variables of age, total years of library service, and number of subordinates were respectively detected to be negatively and significantly correlated with the structural approach. The structural approach was less likely to be used by directors who were older, or served in libraries for longer periods of time, or oversaw more subordinates.

The human resource approach was more likely to be used by directors who were more educated. However, directors who had been in their current positions for longer periods of time, or worked at a large school or library, or at universities with higher enrollment were less likely to use the human resource approach to communicate with the public and staff than their counterparts. The single approach was more likely to be used by directors who worked at universities with higher enrollment. Directors who oversaw more subordinates were less likely to use dual approaches to communicate with the public and staff than their counterparts.

Table 6.21: Correlation Matrix for Variables Used in the Analysis (N = 455)

Approaches to Communicating with the Public and Staff

	A	B	C	D	E	F
1	.026	-.036	-.009	-.032	.031	.009
2	-.137***	.099**	-.019	.006	.010	.019
3	-.025	.049	.020	-.012	-.006	-.020
4	-.018	-.063*	-.061	.006	.041	.061*
5	-.027	-.040	-.049	-.010	.045	.049
6	-.072*	.031	-.026	.016	.008	.026
7	-.034	.033	.002	-.009	.005	-.002
8	-.072*	.033	-.025	-.076*	.076*	.025
9	-.035	-.018	-.038	.009	.022	.038
10	-.015	-.102**	.067	-.053	-.011	-.067*
11	.030	.087**	.087**	.010	-.073*	-.087**

Notes: A=Structural, B=Human Resource, C=Single, D=Dual, E=Multiple,
F=Single Approaches vs. Dual & Multiple Approaches
1=Male, 2=Age, 3=Education, 4=Years at Present Position, 5=Total Years of Directorship,
6=Total Years of Library Service, 7=No. of Different Positions, 8=No. of Subordinates,
9=No. of Library Branches, 10=Library Type, 11=Library Size
*p≤ 0.10; **p ≤ 0.05; ***p ≤ 0.01; ****p≤0. 001

Results of Multinomial and Binary Logistic Regressions

The hypotheses of this study focus on directors' use of multiple approaches versus single approaches. Thus, "single approaches" is used as the reference category. Table 6.22 reports the multinomial logistic regression estimates that predict directors' approaches to communicating with the public and staff. The estimated pseudo R^2 demonstrates that this set of variables/subscales explains 4.7% of the variation in the

directors' approaches to communicating with the public and staff. The results show that only one predictor-library size—significantly impact the outcome variables.

The predictor of library size was detected to be significantly and negatively related to the use of single approaches versus multiple approaches. Each additional level in library size decreased the likelihood by 29.7% of using multiple approaches rather than single approaches. Directors who worked at schools with higher enrollment were less likely to use multiple approaches to communicate with the public and staff than those with lower enrollment. This rejects the hypothesis that directors who work for a college or university with higher enrollment are more likely than their counterparts to use the multi-frame approach while managing change.

The relationship between number of branch and the use of dual approaches was detected to be marginally significant (significance near .10). The other variables might not have any significant impact of the directors' approaches used (significance far from .10).

Binary logistic regression was used to check whether the results would change. Table 6.23 reports binary logistic regression estimates that predict directors' approaches to communicating with the public and staff. The estimated pseudo R^2 demonstrates that this set of variables/subscales explains 4.4% of the variation in the directors' approaches to communicating with the public and staff. Results show that the predictor of library size still significantly affects the outcome variables.

Table 6.22: Multinomial Logistic Regression Estimates Predicting Approaches to Communicating with the Public and Staff (N = 455)

	Dual Approaches vs. Single Approaches		Multiple Approaches vs. Single Approaches	
Predictors	*B*	exp(*B*)	*B*	exp(*B*)
Male	-.127	.880	.024	1.025
	(.436)		(.326)	
Age	.006	1.006	-.008	.992
	(.177)		(.131)	
Education Level	-.035	.965	-.085	.919
	(.197)		(.148)	
Years of Present Position	.019	1.019	.022	1.022
	(.037)		(.029)	
Total Years of Directorship	-.001	.999	.008	1.008
	(.033)		(.025)	
Total Years of	.016	1.016	.000	1.000
Library Service	(.031)		(.022)	
No. of Different	-.003	.997	.015	1.015
Positions	(.087)		(.063)	
No. of	-.075	.928	.179	1.196
Subordinates	(.196)		(.145)	
No. of Library	.124	1.132	.111	1.118
Branches	(.091)		(.081)	
Library Type	-.464	.629	-.236	.790
	(.336)		(.254)	
Library Size	-.110	.896	-.353*	.703
	(.267)		(.192)	
Constant	.743		2.497***	
	(.1.186)		(.887)	
-2 log likelihood		590.0		
Model χ^2		15.9		
Pseudo R^2		.047		
Df		22		
N		455		

Notes: The *B* is the logistic regression coefficient; exp (*B*) or odds ratio is the antilog of *B*; standard errors are in parentheses.
*p< 0.10; **p < 0.05; ***p < 0.01; ****p ≤ 0.001

Table 6.23: Binary Logistic Regression Estimates Predicting Approaches to Communicating with the Public and Staff (N = 455)

	Dual & Multiple Approaches vs. Single Approaches	
Predictors	*B*	exp(*B*)
Male	.006	1.006
	(.323)	
Age	-.006	.994
	(.130)	
Education Level	-.079	.924
	(.147)	
Years of Present Position	.022	1.022
	(.029)	
Total Years of Directorship	.007	1.007
	(.024)	
Total Years of Library Service	.001	1.001
	(.022)	
No. of Different Positions	.014	1.014
	(.062)	
No. of Subordinates	.148	1.159
	(.144)	
No. of Library Branches	.112	1.119
	(.081)	
Library Type	-.262	.770
	(.252)	
Library Size	-.321*	.725
	(.189)	
Constant	2.656***	14.234
	(.881)	
-2 log likelihood		300.8
Model χ^2		10.1
Pseudo R^2		.044
Df		11
N		455

Notes: The *B* is the logistic regression coefficient; exp (*B*) or odds ratio is the antilog of *B*; and standard errors are in parentheses.

*p< 0.10; **p< 0.50; ***p ≤ 0.01; ****p ≤ 0.001

Taking into account the independent variables used in this study, Table 6.24 reports on the multinomial logistic regression estimates that predict the directors' approaches to communicating with the public and staff. As a reference category, the human resource approach was used more often than any other single approach. The estimated pseudo R^2 indicates that this set of variables/subscales explains 9.9% of the variation of the directors' approaches. Results display that independent variables, such as age, and library type, significantly influence the outcome variables.

Age was detected to have consistent significant effects on three models. It was detected to be statistically negatively and significantly related to the probability of using the structural approach rather than the human resource approach to communicate with the public and staff. Each additional level in age decreased the likelihood by 58.9% of using the structural approach rather than the human resource approach. Older directors were less likely to use the structural approach than younger directors.

The relationship between age and the use of human resource approach versus dual approaches was detected to be negative and significant. Each additional level in age decreased the likelihood by 38.2% of using dual approaches rather than the human resource approach. Older directors were less likely to use dual approaches to communicate with the public and staff than younger directors.

There was a negative and significant relationship between age and the use of the human resource approach versus multiple approaches. Each additional level in age decreased the likelihood by 39% of using multiple approaches rather than the human

resource approach. Older directors were less likely to use multiple approaches to communicate with the public and staff than younger directors. This rejects the hypothesis that older directors are more likely to use the multi-frame approach than younger ones.

The relationship between library type and the use of the human resource approach versus dual approaches was detected to be negative and significant. Those who worked for a higher academic degree college or university would be less likely than their counterparts to use the dual approaches rather than the human resource approach when communicating with the public and staff. For each additional level of library type, this likelihood decreased 50.9%.

In terms of using the human resource approach versus multiple approaches, library type was detected to be a marginally significant predictor (significance close to .10). However, the results of other variables did not significantly impact the directors' approaches used (significance far from .10).

Table 6.24: Multinomial Logistic Regression Estimates Predicting Approaches to Communicating with the Public and Staff (N = 455)

	Structural vs. Human Resource		Dual vs. Human Resource		Multiple vs. Human Resource	
Predictors	*B*	exp(*B*)	*B*	exp(*B*)	*B*	exp(*B*)
Male	.680	1.974	.218	1.244	.370	1.448
	(.633)		(.530)		(.444)	
Age	-.890****	.411	-.481**	.618	-.495**	.610
	(.276)		(.240)		(.208)	
Education	-.200	.819	-.134	.875	-.182	.883
	(.286)		(.231)		(.191)	
Years of Present Position	.052	1.053	.045	1.046	.048	1.049
	(.056)		(.047)		(.041)	
Total Years of Directorship	.048	1.049	.022	1.022	.031	1.031
	(.048)		(.039)		(.032)	
Total Years of Library Service	.015	1.015	.021	1.021	.005	1.005
	(.045)		(.034)		(.027)	
No. of Different Positions	.030	1.030	.004	1.004	.022	1.022
	(.124)		(.096)		(.074)	
No. of Subordinates	-.126	.881	-.123	.884	.129	1.138
	(.281)		(.232)		(.191)	
No. of Library Branches	.002	1.002	.129	1.138	.116	1.123
	(.162)		(.111)		(.103)	
Library Type	-.530	.588	-.712*	.491	-.484	.616
	(.494)		(.410)		(.346)	
Library Size	.257	1.293	.002	1.002	-.240	.786
	(.358)		(.308)		(.245)	
Constant	5.807***		4.899***		6.645****	
	(1.867)		(1.740)		(1.544)	
-2 log likelihood				637.1		
Model χ^2				36.3		
Pseudo R^2				.099		
df				33		
N				455		

Notes: The *B* is the logistic regression coefficient; exp (*B*) or odds ratio is the antilog of *B*; and standard errors are in parentheses.
*p 0.10; **p 0.50; ***p 0.01; ****p 0.001.

Approaches to Managing Change

Question 14. What approaches would you employ to manage change if you were Colin?

Descriptive Results

As displayed in Table 6.25 below, 75.8% directors would employ multiple approaches to manage change if they were Colin, while only 15.2% used dual approaches. The total single approaches would only be used by 9.0% of all respondents. No respondent would use single political, symbolic, or other approach to managing change. No respondent checked N/A (not applicable) for each response.

The structural and human resource approaches were favored by directors choosing dual or multiple approaches. Most likely, these approaches appear together more often over the others because directors spend much of their time working with a variety of people and realigning roles and duties of staff in current academic libraries that are caught up in the mode of rapidly changing technology.

The "other" approach was noted by 19 (4.2%) respondents. Of these respondents, 12 commented on the "other" approach they would use. However, no respondent listed a true "other" approach. According to the Bolman and Deal's model, four responses were actually the human resource approach; three, symbolic; three, dual approaches; and two, comments. The remaining 7 respondents did not specify what their other approaches were and therefore could not be ruled out as not actually using "other approach" category in Table 6.25. As a result, 7 respondents are included in the "other approach" category in Table 6.25.

The free comments on the "other" approach respondents used show that directors used the human resource, symbolic, and dual approaches more than other approaches while managing change. They focused on empowering staff, creating social rituals, and dealing with conflicts in the change process.

Dependent Variables

Table 6.25 shows descriptive statistical results of the dependent variables used in the analysis. The dependent variable is the directors' approaches to managing change. It comprises three main categories: (1) single approaches; (2) dual approaches; and (3) multiple approaches. The single approaches consist of two subcategories: (1) structural; and (2) human resource.

Table 6.25: Approaches Used in Response to Question 14: What Approaches Would You Employ to Manage Change if You Were Colin? (N = 455)

Approaches Used	No. of Responses	(%)
SINGLE APPROACHES		
STRUCTURAL		
▪ Communicate and realign formal roles and relationships to reduce confusion and unpredictability	20	(4.4)
HUMAN RESOURCE		
▪ Provide training and support for people who feel incompetent, needy, and powerless because of change	21	(4.6)
POLITICAL		
▪ Deal with conflict and form new coalitions	0	(0)
SYMBOLIC		
▪ Create rituals	0	(0)
OTHER		
▪ Use a completely different approach	0	(0)
Total Responses	41	(9.0)
DUAL APPROACHES		
▪ Structural and human resource	49	(10.8)
▪ Structural and political	2	(0.4)
▪ Human resource and political	14	(3.1)
▪ Human resource and symbolic	4	(0.9)
Total Responses	69	(15.2)
MULTIPLE APPROACHES		
▪ Structural, human resource, and political	174	(38.2)
▪ Structural, human resource, political, and symbolic	147	(32.3)
▪ Structural, human resource, and symbolic	9	(2.0)
▪ Structural, political, and symbolic	1	(0.2)
▪ Human resource, political, and symbolic	7	(1.5)
▪ Human resource, political, and other	7	(1.5)
Total Responses	345	(75.8)

Legend: No. Number

Results of Bivariate Crosstabulation and χ^2 Test

The bivariate cross-tabulation indicated that there were many significant associations between the independent variables and the directors' approaches to managing change (Table 6.26). The chi-square test was used to check whether two

nominal variables are independent from or related to each other (Sarantakos 2005, 385). The collected continuous variables were recoded as the categorical ones. The ordinal variables with more categories were also recoded for the sake of reliable results. Results indicated that demographics, human capital, and library characteristics could be used to predict respondents' approaches to managing change.

The χ^2 test displayed no statistically significant relationship between gender and approaches to managing change at the .10 level. However, the percentage result display that males employed dual and multiple approaches more to mange change than females.

The χ^2 test demonstrates that there was statistically significant relationship between age and approaches to managing change at the .05 level. But, the minimum expected count is below 5.0. The result cannot be trusted. However, the percentage results display that directors who were twenty-five to thirty-nine employed dual approaches more, while directors who were forty years or more used the multi-frame approach more.

The χ^2 test did not detect any statistically significant association between education level and approaches to managing change at the .10 level. However, the percentage results display that those who obtained MA/MS not in library science and other used the multi-frame approach more, while those who got PhD employed dual approaches more.

The χ^2 test shows that there was a very significant relationship between directors' approaches to managing change and library type at the .001 level. The minimum

expected count is 10.18. The result can be trusted. Those who worked for a baccalaureate-granting college or university were more likely to use the single and dual approaches, while those who worked for a doctoral-granting college or university were more likely to use the multi-frame approach. This supports the hypothesis that directors who work for a higher academic degree college or university are more likely than their counterparts to use the multi-frame approach while managing change.

The χ^2 test did not detect any statistically significant connection between directors' approaches and library size at the .10 level. However, the percentage results demonstrate that those who worked for a college or university with less than 10,000 total student enrollment used single and dual approaches more, while those who worked for a college or university with 10,000 to 19,999 student enrollment used multiple approaches more.

According to the results of the χ^2 tests in Table 6.26 (continued) below, there were no statistically significant relationships between directors' approaches and these predictors: years of present positions, years of all directorship, years of library service, number of different positions, number of subordinates, and number of library branches at the .10 level. Since most chi-square results are not significant, there are no significant relationships. However, the percentage results display that directors who had been in their current positions for fewer than one year to four years employed the multi-frame approach more, while those for ten years or more utilized single and dual approaches more to manage change.

Those who had been in all directorship for ten to fourteen years utilized the multi-frame approach more, while those for fifteen years or more used dual approaches more.

Directors who served in libraries for fewer than one year to fourteen years used single approaches more, while those for fifteen to twenty-nine used dual approaches more. Those who served for thirty years or more used the multi-frame approach more.

Those who held seven or more different positions employed the multi-frame approach more, while those who held four to six different positions used dual approaches more.

Directors who oversaw thirty or more subordinates employed the multi-frame approach more, while those who oversaw twenty to twenty-nine subordinates used dual approaches more.

Those who oversaw two or more library branches used the multi-frame approach more, while those who oversaw one branch employed single approaches more to manage change.

Table 6.26: Percentage Distribution of Directors' Attitudes toward Approaches Used to Manage Change (N = 455)

	Approaches Used (%)				
	Single	Dual	Multiple	Total	No.
Gender					
Female	10.6	13.8	75.6	100.0	(254)
Male	7.0	16.9	76.1	100.0	(201)
χ^2 = 2.404, df = 2, p = .301					
Age					
25-39	11.5	26.9	61.5	100.0	(26)
40-59	11.0	12.4	76.7	100.0	(283)
60 or more	4.8	18.5	76.7	100.0	(146)
χ^2 = 9.890, df = 4, p = .042					
Education Level					
MA/MS not in Library Science & Other	5.6	5.6	88.9	100.0	(18)
MLS	10.7	15.3	74.0	100.0	(177)
MLS plus other master's degree	8.1	14.9	77.0	100.0	(161)
PhD	8.1	17.2	74.7	100.0	(99)
χ^2 = 2.968, df = 6, p = .813					
Type of Institution					
Baccalaureate-granting	18.6	20.4	61.1	100.0	(113)
Master-granting	7.6	13.5	78.9	100.0	(185)
Doctoral-granting	3.8	13.4	82.8	100.0	(157)
χ^2 = 23.772, df = 4, p = .000					
Total Student Enrollment					
10,000	10.3	17.0	72.6	100.0	(329)
10,000-19,999	6.2	9.2	84.6	100.0	(65)
20,000 or more	4.9	11.5	83.6	100.0	(61)
χ^2 = 6.755, df = 4, p = .149					
Total	9.0	15.2	75.8	100.0	
No.	(41)	(69)	(345)	(455)	

Legend: No. = Number

Table 6.26 (continued)

	Approaches Used (%)				
	Single	Dual	Multiple	Total	No.
Years of Present Position					
0 - 4	7.2	15.6	77.2	100.0	(167)
5 - 9	9.7	13.2	77.1	100.0	(144)
10 or more	10.4	16.7	72.9	100.0	(144)
χ^2 = 1.850, df = 4, p = .763					
Years of All Directorship					
0 - 4	7.4	13.0	79.6	100.0	(108)
5 - 9	10.4	13.9	75.7	100.0	(115)
10 - 14	7.6	12.7	79.7	100.0	(79)
15 or more	9.8	19.0	71.2	100.0	(153)
χ^2 = 3.880, df = 6, p = .693					
Years of Library Services					
0 - 14	12.5	12.5	75.0	100.0	(56)
15 - 29	9.3	15.7	75.0	100.0	(172)
30 or more	7.9	15.4	76.7	100.0	(227)
χ^2 = 1.412, df = 4, p = .842					
Number of Different Positions					
0 - 3	11.1	13.7	75.2	100.0	(153)
4 - 6	8.7	18.8	72.5	100.0	(207)
7 or more	6.3	9.5	84.2	100.0	(95)
χ^2 = 6.818, df = 4, p = .146					
Number of Subordinates					
1 - 9	12.5	16.4	71.1	100.0	(128)
10 - 19	10.6	14.6	74.8	100.0	(123)
20 - 29	6.2	21.5	72.3	100.0	(65)
30 or more	5.8	11.5	82.7	100.0	(139)
χ^2 = 8.778, df = 6, p = .186					
Number of Library Branches					
0	9.8	17.1	73.2	100.0	(164)
1	10.2	15.6	74.3	100.0	(167)
2 or more	6.5	12.1	81.5	100.0	(124)
χ^2 = 3.162, df = 4, p = .531					
Total	9.0	15.2	75.8	100.0	
No.	(41)	(69)	(345)	(455)	

Legend: No. = Number

Results of Correlations

In Table 6.27 below, bivariate correlations show that there are many significant correlations between the independent variables and the directors' approaches to managing change.

Correlations between Independent Variables and Dependent Variables

The results of this study concurred with a number of the hypotheses presented earlier regarding the use of multiple approaches (Table 6.27). However, calculated r values for the variables were < .30, making the correlations very weak or low rather than moderate or strong. In this study, there was no significant association between male and directors' multiple approaches used. Correlations between the following variables and the use of multiple approaches were detected to be positive and significant:

- Age
- Number of different positions
- Number of subordinates
- Number of library branches
- Library type
- Library size

Directors who were older, held more different positions, oversaw more subordinates or more library branches, or worked at a large school or library, or at universities with higher enrollment were more likely to use the multi-frame approach to manage change than their counterparts. However, the study results contradicted the hypotheses that

directors who had been in their current positions or entire directorship for longer periods of time would choose multiple approaches.

Male, age, total years of library service, number of subordinates, and library type were respectively detected to be positively and significantly correlated with the use of dual and multiple approaches. Dual and multiple approaches were more likely to be used by directors who were males or older, served in libraries for longer periods of time, oversaw more subordinates, or worked at a large school or library.

Significant and negative correlations displayed that directors who were males or older, served in libraries for longer periods of time, or worked at a large school or library, or at universities with higher enrollment were less likely to use the structural approach to manage change than their counterparts. Similar variables and weak correlations were also noted for directors who used single approaches. Directors who oversaw more subordinates were less likely to utilize single approaches to manage change than their counterparts.

The human resource approach was less likely to be used by directors who were older, oversaw more subordinates, or worked at a large school or library. Directors who had been in directorship for longer periods of time were more likely than their counterparts to use dual approaches to manage change. However, negative and significant correlations were noted for directors who worked at a large school or library, or at universities with higher enrollment.

Table 6.27: Correlation Matrix for Variables Used in the Analysis (N = 455)

Approaches to Managing Change

	A	B	C	D	E	F
1	-.104**	.015	-.064*	.043	.006	.064*
2	-.072*	-.082**	-.112***	-.003	.078**	.112***
3	-.037	.021	-.012	.046	-.030	.012
4	.025	.032	.041	.041	-.062*	-.044
5	.012	.011	.017	.073*	-.072*	-.018
6	-.066*	-.053	-.086**	.027	.035	.076*
7	-.033	-.043	-.056	-.056	.084**	.050
8	-.031	-.105**	-.099**	-.039	.099**	.080**
9	-.036	-.022	-.042	-.058	.076*	.030
10	-.111***	-.151****	-.190****	-.070*	.186****	.170****
11	-.067*	-.023	-.065*	-.068*	.101**	.039

Notes: A=Structural, B=Human Resource, C=Single, D=Dual, E=Multiple, F=Single Approaches vs. Dual & Multiple Approaches
1=Male, 2=Age, 3=Education, 4=Years at Present Position, 5=Total Years of Directorship, 6=Total Years of Library Service, 7=No. of Different Positions, 8=No. of Subordinates, 9=No. of Library Branches, 10=Library Type, 11=Library Size
*$p \leq 0.10$; **$p \leq 0.05$; ***$p \leq 0.01$; ****$p \leq 0.001$

Results of Multinomial and Binary Logistic Regressions

The hypotheses of this study focus on directors' use of multiple approaches versus single approaches. Thus, "single approaches" is used as the reference category. Table 6.28 reports the multinomial logistic regression estimates that predict directors' approaches to managing change. The estimated pseudo R^2 displays that this set of variables/subscales explains 10.6% of the variation in the directors' approaches to

managing change. The results show that independent variables—age and library type—significantly impact the outcome variables.

Age was detected to be positively and statistically significant related to the use of single approaches versus multiple approaches. Each additional level in age increased the likelihood by 30.6% in using multiple approaches rather than single approaches. The older directors were more likely to use multiple approaches than younger ones. This supports the hypothesis that older directors are more likely than younger ones to use the multi-frame approach while managing change.

There was a positive and significant relationship between library type and the use of single approaches versus dual approaches. Directors who worked for a higher academic degree college or university were about 99% more likely than their counterparts to use dual approaches rather than single approaches to manage change.

The relationship between library type and the use of single approaches versus multiple approaches was detected to be positive and very significant. Directors who worked for a higher academic degree college or university were about 2.7 times as likely as their counterparts to use multiple approaches rather than single approaches. This supports the hypothesis that directors who work for a higher academic degree college or university are more likely than their counterparts to use the multi-frame approach to manage change.

The relationship between male and the use of dual approaches was detected to be marginally significant (significant near .10). This was also true for the relationship

between male and the use of multiple approaches, and the relationship between the total years of directorship and the directors' use of multiple approaches (significance near .10). The other variables might not have any significant impact of the directors' approaches used (significance far from .01).

Binary logistic regression was used to check whether the results would change. Table 6.29 lists binary logistic regression estimates that predict directors' approaches to managing change. The estimated pseudo R^2 shows that this set of variables/subscales explains 11.5% of the variation in the directors' approaches to managing change. Results indicate that independent variables, such as age and library type, still show significant impact on the outcome variables.

Table 6.28: Multinomial Logistic Regression Estimates Predicting Approaches to Managing Change (N = 455)

	Dual Approaches vs. Single Approaches		Multiple Approaches vs. Single Approaches	
Predictors	*B*	exp(*B*)	*B*	exp(*B*)
Male	.658	1.931	.564	1.757
	(.437)		(.380)	
Age	.153	1.165	.267**	1.306
	(.169)		(.141)	
Education Level	-.015	.985	-.129	.879
	(.193)		(.166)	
Years of Present Position	-.025	.976	-.016	.984
	(.033)		(.029)	
Total Years of Directorship	-.019	.981	-.043	.958
	(.033)		(.029)	
Total Years of	.032	1.033	.017	1.017
Library Service	(.031)		(.026)	
No. of Different	-.073	.930	-.008	.992
Positions	(.093)		(.071)	
No. of	.051	1.052	.086	1.090
Subordinates	(.203)		(.174)	
No. of Library	-.047	.954	-.005	.995
Branches	(.091)		(.067)	
Library Type	.690**	1.993	.981****	2.668
	(.341)		(.295)	
Library Size	-.275	.760	-.236	.790
	(.333)		(.280)	
Constant	-1.635		-746	
	(1.064)		(.888)	
-2 log likelihood		610.6		
Model χ^2		38.0		
Pseudo R^2		.106		
Df		22		
N		455		

Notes: The *B* is the logistic regression coefficient; exp (*B*) or odds ratio is the antilog of *B*; and standard errors are in parentheses.
*p≤0.10; **p ≤ 0.05; ***p ≤ 0.01; ****p ≤ 0.001

Table 6.29: Binary Logistic Regression Estimates Predicting Approaches to Managing Change (N = 455)

	Dual & Multiple Approaches vs. Single Approaches	
Predictors	*B*	exp(*B*)
Male	.563	1.756
	(.375)	
Age	.278**	1.321
	(.140)	
Education Level	-.088	.915
	(.162)	
Years of Present Position	-.021	.979
	(.028)	
Total Years of Directorship	-.036	.965
	(.028)	
Total Years of Library Service	.013	1.013
	(.025)	
No. of Different Positions	-.015	.985
	(.070)	
No. of Subordinates	.032	1.033
	(.169)	
No. of Library Branches	-.007	.993
	(.059)	
Library Type	.907***	2.477
	(.289)	
Library Size	-.350	.704
	(.259)	
Constant	-.281	.755
	(.863)	
-2 log likelihood		251.0
Model χ^2		24.5
Pseudo R^2		.115
Df		11
N		455

Notes: The *B* is the logistic regression coefficient; exp (*B*) or odds ratio is the antilog of *B*; and standard errors are in parentheses.

*p < 0.10; **p < 0.50; ***p < 0.01; ****p < 0.001

Table 6.30 reports on the multinomial logistic regression estimates that predict the directors' approaches to managing change. As a reference category, the human resource approach was used more often than any other single approach. The estimated pseudo R^2 indicates that this set of variables/subscales explains 12.3% of the variation of the directors' approaches to managing change. Results show that independent variables, such as male, library type, and library size, significantly impact the outcome variables.

There was a negative and significant relationship between male and the use of the human resource approach versus structural approach. Males were about 74% less likely than females to use the structural approach rather than human resource approach.

Library type was detected to be positively and significantly related to the use of the human resource approach versus dual approaches. Directors who worked for a higher academic degree college or university were about 2.7 times as likely as their counterparts to use dual approaches to manage change. The relationship between library type and the use of the human resource approach versus multiple approaches was found to be positive and very significant. Directors who worked for a higher academic degree college or university were about 3.6 times as likely as their counterparts to use multiple approaches rather than single approaches to mange change. This supports the hypothesis that directors who work for a higher academic degree college or university are more likely than their counterparts to use the multi-frame approach while dealing with change.

There was a negative and significant relationship between library size and the human resource approach versus multiple approaches. Each additional level in library

size decreased the likelihood by 45.2% in using multiple approaches. Those who worked for a college or university with higher enrollment were less likely to use multiple approaches than their counterparts. This rejects the hypothesis that directors with more enrollments are more likely to use the multi-frame approach than their counterparts.

In terms of using the human resource approach versus multiple approaches, age was a marginally significant predictor (significance close to .10). However, the results of other variables did not significantly impact the directors' approaches used (significance far from .10).

Table 6.30: Multinomial Logistic Regression Estimates Predicting Approaches to Managing Change (N = 455)

	Structural vs. Human Resource		Dual vs. Human Resource		Multiple vs. Human Resource	
Predictors	*B*	exp(*B*)	*B*	exp(*B*)	*B*	exp(*B*)
Male	-1.332*	.264	.053	1.054	-.044	.957
	(.750)		(.540)		(.496)	
Age	.063	1.065	.182	1.200	.296	1.345
	(.257)		(.214)		(.194)	
Education	-.223	.800	-.120	.887	-.234	.791
	(.309)		(.237)		(.217)	
Years of Present Position	-.003	.997	-.025	.975	-.017	.983
	(.053)		(.042)		(.038)	
Total Years of Directorship	.023	1.024	-.007	.993	-.031	.969
	(.054)		(.042)		(.039)	
Total Years of Library Service	-.030	.971	.018	1.016	.000	1.000
	(.048)		(.043)		(.039)	
No. of Different Positions	.002	1.002	-.067	.935	-.002	.998
	(.134)		(.120)		(.104)	
No. of Subordinates	.428	1.534	.270	1.310	.306	1.358
	(.330)		(.269)		(.247)	
No. of Library Branches	-.014	.987	-.051	.950	-.009	.991
	(.140)		(.103)		(.082)	
Library Type	.554	1.740	.981**	2.666	1.273***	3.573
	(.562)		(.457)		(.424)	
Library Size	-.789	.454	-.640	.527	-.602*	.548
	(.574)		(.400)		(.357)	
Constant	.536		-.673		.218	
	(1.607)		(1.302)		(1.165)	
-2 log likelihood				658.9		
Model χ^2				46.5		
Pseudo R^2				.123		
df				33		
N				455		

Notes: The *B* is the logistic regression coefficient; exp (*B*) or odds ratio is the antilog of *B*; and standard errors are in parentheses.
*p < 0.10; **p < 0.50; ***p < 0.01; ****p < 0.001.

Approaches to Conducting Meetings

Question 15. How would you conduct meetings if you were Frank?

Questions 15 and 17 refer to a second hypothetical situation. "Frank" is a newly hired director who is confronted with an extensive backlog of cataloging. Directors' responses to this question varied (Table 6.31).

Descriptive Results

Table 6.31 below displays that 52.3% directors would employ multiple approaches to conduct meetings if they were Colin, while 29.7% used dual approaches. The total single approaches would be used by 18.0% of all respondents. No respondent would use the single political approach to conduct meetings. No respondent checked N/A (not applicable) for each response.

The structural and human resource approaches were favored by directors choosing dual or multiple approaches. Most likely, these approaches appear together more often over the others because directors spend much of their time working with a variety of people and realigning roles and duties of staff in current academic libraries that are caught up in the mode of rapidly changing technology.

The "other" approach was noted by 41 (9.0%) respondents. Of these respondents, 12 commented on the "other" approach they would use. However, two respondents listed true "other" approaches. According to the Bolman and Deal's model, one response was actually the structural approach; three, human resources; one, political; one, symbolic; five, dual approach; and one, multi-frame approach. The remaining 29 respondents did

not specify what their other approaches were and therefore could not be ruled out as not actually using "other approach" category in Table 6.31. As a result, 31 respondents are included in the "other approach" category in Table 6.31.

The free comments on the "other" approach respondents used show that directors used varied approaches to conduct meetings. They set goals, exchanged information and views, negotiated a compromise, asserted values, brought in a consultant, and performed outside contracting in the change process.

Dependent Variables

Table 6.31 reports descriptive statistical results of the dependent variables used in the analysis. The dependent variable is the directors' approaches to conducting meetings. It consists of three main categories: (1) single approaches; (2) dual approaches; and (3) multiple approaches. The single approaches comprise four subcategories: (1) structural; (2) human resource; (3) symbolic; and (4) other.

Table 6.31: Approaches Used in Response to Question 15: How Would You Conduct Meetings if You Were Frank? (N = 455)

Approaches Used	No. of Responses	(%)
SINGLE APPROACHES		
STRUCTURAL		
▪ Occasions for making change decisions	36	(7.9)
HUMAN RESOURCE		
▪ Informal opportunities for expressing feelings and building relationships	25	(5.5)
POLITICAL		
▪ Chances to prove myself and score points with the staff	0	(0)
SYMBOLIC		
▪ Occasions to celebrate and transform the values	11	(2.4)
OTHER		
▪ Use a completely different approach	10	(2.2)
Total Responses	82	(18.0)
DUAL APPROACHES		
▪ Structural and human resource	47	(10.3)
▪ Structural and political	2	(0.4)
▪ Structural and symbolic	25	(5.5)
▪ Human resource and political	3	(0.7)
▪ Human resource and symbolic	56	(12.3)
▪ Human resource and other	2	(0.4)
Total Responses	135	(29.7)
MULTIPLE APPROACHES		
▪ Structural, human resource, and symbolic	170	(37.4)
▪ Structural, human resource, political, and symbolic	33	(7.3)
▪ Structural, human resource, and political	9	(2.0)
▪ Structural, human resource, symbolic, and other	8	(1.8)
▪ Structural, human resource, and other	5	(1.1)
▪ Structural, human resource, political, and other	1	(0.2)
▪ Structural, political, and symbolic	2	(0.4)
▪ Structural, symbolic, and other	1	(0.2)
▪ Human resource, political, and symbolic	5	(1.1)
▪ Human resource, symbolic, and other	2	(0.4)
▪ Human resource, political, symbolic, and other	2	(0.4)
Total Responses	238	(52.3)

Legend: No. = Number

Results of Bivariate Crosstabulation and χ^2 Test

The bivariate cross-tabulation indicated that there were many significant associations between the independent variables and the directors' approaches to conducting meetings (Table 6.32). The chi-square test was used to check whether two nominal variables are independent from or related to each other (Sarantakos 2005, 385). The collected continuous variables were recoded as the categorical ones. The ordinal variables with more categories were also recoded for the sake of reliable results.

The χ^2 tests did not detect any significant relationship between directors' approaches used and these variables: gender, age, and education level at the .10 level. Thus, there are no significant relationships. However, the percentage result shows that females used dual and multiple approaches slightly more to conduct meetings than males. Directors who were twenty five to thirty-nine employed dual approaches more, while directors who were forty to fifty-nine used the single and multi-frame approach more. Those who obtained MA/MS not in library science and other utilized dual approaches more to conduct meetings, while those who got MLS plus other master's degree employed multiple approaches more.

The χ^2 test shows that there was a significant relationship between directors' approaches used and library type at the .10 level. The minimum expected count is 20.36. Thus, the result can be trusted. Those who worked for a baccalaureate-granting college or university were more likely to use the single approach, while those who worked for a master-granting college or university were more likely to use the multi-frame approach.

The χ^2 test did not demonstrate any statistically significant connection between directors' approaches used and library size at the .10 level. However, the percentage results display that those who worked for a college or university with less than 10,000 total student enrollment used dual approaches more, while those who worked for a college or university with 20,000 or more student enrollment employed multiple approaches more.

According to the results of the χ^2 tests in Table 6.32 (continued) below, there were no significant relationships between directors' approaches used and these predictors: years of present position, years of all directorship, and years of library service at the .10 level. However, the percentage results display that directors who had been in their current positions for fewer than one year to four years employed the multi-frame approach more, while those for ten years or more used single approaches more. Those who had been in all directorship for ten to fourteen years used the multi-frame approach more to conduct meetings, while those for fifteen years or more utilized dual approaches more. Directors who served in libraries for thirty or more years employed dual and multiple approaches more.

The result of the χ^2 test displays that there was a significant relationship between directors' approaches used and number of different positions at the .05 level. The minimum expected count is 17.12. This result can be trusted. Those who held seven or more different positions were more likely to use the multi-frame approach, while those who held one to three different positions were likely to use single and dual approaches.

This supports the hypothesis that directors who have held more different positions are more likely than their counterparts to use multiple approaches to manage change.

According to the result of the χ^2 tests, there were no significant relationships between directors' approaches used and these variables: number of subordinates and number of library branches at the .10 level. There are no significant relationships. However, the percentage results display that directors who oversaw thirty or more subordinates employed dual approaches more, while those who oversaw twenty to twenty-nine subordinates used multiple approaches more. Those who oversaw one branch employed dual and multiple approaches more than those overseeing zero or two or more.

Table 6.32: Percentage Distribution of Directors' Attitudes toward Approaches Used to Conduct Meetings (N = 455)

	Approaches Used (%)				
	Single	Dual	Multiple	Total	No.
Gender					
Female	16.5	30.7	52.8	100.0	(254)
Male	19.9	28.4	51.7	100.0	(201)
χ^2 .936, df = 2, p = .626					
Age					
25 39	15.4	34.6	50.0	100.0	(26)
40-59	18.4	27.9	53.7	100.0	(283)
60 or more	17.8	32.2	50.0	100.0	(146)
χ^2 = 1.226, df 4, p = .874					
Education Level					
MA/MS not in Library Science & Other	16.7	33.3	50.0	100.0	(18)
MLS	18.6	32.2	49.2	100.0	(177)
MLS plus other master's degree	14.9	28.6	56.5	100.0	(161)
PhD	22.2	26.3	51.5	100.0	(99)
χ^2 3.723, df = 6, p .714					
Type of Institution					
Baccalaureate-granting	21.2	30.1	48.7	100.0	(113)
Master-granting	17.3	23.8	58.9	100.0	(185)
Doctoral-granting	16.6	36.3	47.1	100.0	(157)
χ^2 8.021, df = 4, p = .091					
Total Student Enrollment					
= 10,000	16.7	29.5	53.8	100.0	(329)
10,000 19,999	24.6	33.8	41.5	100.0	(65)
20,000 or more	18.0	26.2	55.7	100.0	(61)
χ^2 4.226, df 4, p .376					
Total	18.0	29.7	52.3	100.0	
No.	(82)	(135)	(238)	(455)	

Legend: No. Number

Table 6.32 (continued)

	Approaches Used (%) Single	Dual	Multiple	Total	No.
Years of Present Position					
0 - 4	15.6	27.5	56.9	100.0	(167)
5 - 9	16.7	31.3	52.1	100.0	(144)
10 or more	22.2	30.6	47.2	100.0	(144)
$\chi2 = 3.910$, df = 4, p = .418					
Years of All Directorship					
0 - 4	14.8	29.6	55.6	100.0	(108)
5 - 9	20.9	24.3	54.8	100.0	(115)
10 - 14	20.3	22.8	57.0	100.0	(79)
15 or more	17.0	37.3	45.8	100.0	(153)
$\chi2 = 8.706$, df = 6, p = .191					
Years of Library Services					
0 - 14	23.2	28.6	48.2	100.0	(56)
15 - 29	19.2	29.1	51.7	100.0	(172)
30 or more	15.9	30.4	53.7	100.0	(227)
$\chi2 = 1.920$, df = 4, p = .751					
Number of Different Positions					
0 - 3	24.2	32.7	43.1	100.0	(153)
4 - 6	15.9	29.0	55.1	100.0	(207)
7 or more	12.6	26.3	61.1	100.0	(95)
$\chi2 = 10.262$, df = 4, p = .036					
Number of Subordinates					
1 - 9	21.1	31.3	47.7	100.0	(128)
10 - 19	20.3	26.0	53.7	100.0	(123)
20 - 29	9.2	26.2	64.6	100.0	(65)
30 or more	17.3	33.1	49.6	100.0	(139)
$\chi2 = 7.989$, df = 6, p = .239					
Number of Library Branches					
0	20.1	27.4	52.4	100.0	(164)
1	14.4	32.3	53.3	100.0	(167)
2 or more	20.2	29.0	50.8	100.0	(124)
$\chi2 = 2.728$, df = 4, p = .604					
Total	18.0	29.7	52.3	100.0	
No.	(82)	(135)	(238)	(455)	

Legend: No. = Number

Results of Correlations

As shown in Table 6.33 below, there are many significant bivariate correlations among the variables used in the analysis.

Correlations between Independent Variables and Dependent Variables

The results of this study coincided with the hypotheses presented earlier regarding the use of multiple approaches (Table 6.33). However, calculated r values for the variables were < .30, making the correlations very weak or low rather than moderate or strong. In this study, there was no significant association between gender and directors' multiple approaches used. Correlation between number of different positions and the use of multiple approaches were detected to be positive and significant. Directors who held more different professional positions were more likely to use multiple approaches to conduct meetings than their counterparts. However, the study results contradicted other hypotheses. Directors who had been in their current positions for longer periods of time were less likely to utilize the multi-frame approach to conduct meetings than their counterparts.

Total years of library service and number of different positions were respectively detected to be positively and significantly correlated with the use of dual and multiple approaches. Directors who served in libraries for longer periods of time or held more positions were more likely than their counterparts to use dual and multiple approaches to conduct meetings. However, the correlations between years at present position and the use of dual and multiple approaches were detected to be negative and significant.

Directors who had been in their current positions for longer periods of time were less likely than their counterparts to use dual and multiple approaches.

The variables of total years of library service and number of different positions were respectively detected to be negatively and significantly correlated with the structural approach. The structural approach was less likely to be used by directors who served in libraries for longer periods of time or held more different professional positions.

The human resource approach was more likely to be used by directors who had been in their current positions for longer periods of time. However, directors who oversaw more subordinates, or worked at a large school or library, were less likely to use the human resource approach to conduct meetings than their counterparts. The symbolic approach was more likely to be used by directors who had been in their current positions for longer periods of time, or held more different positions. However, directors who had higher education levels, oversaw more subordinates, or worked in a large school or library, or at universities with higher enrollment were less likely than their counterparts to use the symbolic approach to conduct meetings.

The correlation between years at present position and the use of other approaches was detected to be negative and significant. Directors who had been in their current positions for longer periods of time were less likely to use other approaches to conduct meetings than their counterparts. However, other approaches were more likely to be used by directors who were more educated, oversaw more subordinates or library branches, or worked at a large school or library.

Directors who had been in their current positions for longer periods of time were more likely to use single approaches to conduct meetings than their counterparts. However, single approaches were less likely to be used by directors who served in libraries for longer periods of time, or held more different positions. Directors who worked at a large library or school were more likely than their counterparts to use dual approaches to conduct meetings.

Table 6.33: Correlation Matrix for Variables Used in the Analysis (N = 455)

Approaches to Conducting Meetings

	A	B	C	D	E	F	G	H
1	.034	.038	-.025	.018	.043	-.026	-.010	-.043
2	-.044	.012	-.004	.050	-.006	.026	-.019	.006
3	-.009	.049	-.088**	.068*	.014	-.042	.028	-.014
4	.004	.074*	.137***	-.061*	.078**	.028	-.085**	-.078**
5	-.023	-.008	.040	.030	.007	.057	-.057	-.007
6	-.103**	-.008	-.019	.019	-.077*	.026	.035	.077*
7	-.106**	-.034	.068*	.015	-.062*	-.046	.089**	.062*
8	-.021	-.079**	-.098**	.117***	-.056	.021	.024	.056
9	.038	-.033	-.050	.070*	.014	.011	-.021	-.014
10	-.005	-.068*	-.076*	.079**	-.044	.063*	-.023	.044
11	.055	.001	-.085**	.055	.026	.005	-.025	-.026

Notes: A=Structural, B=Human Resource, C=Single, D=Dual, E=Multiple,
F=Single Approaches vs. Dual & Multiple Approaches
1=Male, 2=Age, 3=Education, 4=Years at Present Position, 5=Total Years of Directorship,
6=Total Years of Library Service, 7=No. of Different Positions, 8=No. of Subordinates,
9=No. of Library Branches, 10=Library Type, 11=Library Size
*$p \leq 0.10$; **$p \leq 0.05$; ***$p \leq 0.01$; ****$p \leq 0.001$

Results of Multinomial and Binary Logistic Regressions

The hypotheses of this study focus on directors' use of multiple approaches versus single approaches. Thus, "single approaches" is used as the reference category. Table 6.34 reports the multinomial logistic regression estimates that predict directors' approaches to conducting meetings. The estimated pseudo R^2 displays that this set of variables/subscales explains 5.3% of the variation in directors' approaches used. The results demonstrate that independent variables-years at present position, years of all library service, and library type—significantly impact the outcome variables.

There was a negative and significant relationship between total years of present position and the use of single approaches versus dual approaches. Each additional year in a current position decreased the likelihood by 4.1% in using dual approaches rather than single approaches. Those who had been in their current positions for longer periods of time would be less likely than their counterparts to use dual approaches rather than single approaches.

The relationship between total years of present position and use of single approaches versus multiple approaches was significant and negative. Each additional year in a present position decreased the probability by 4.4% of using multiple approaches rather than single approaches. This rejects the hypothesis that directors who have been in their current positions for longer periods of time are more likely to use the multi-frame approach than their counterparts.

A significant and positive relationship between the total years of library service

and the use of single approaches versus multiple approaches was detected. Each additional year of library service increased the likelihood of using multiple approaches by 3.8% . Those who had more years of library service were more likely to use multiple approaches than those who served in libraries for shorter periods of time. This supports the hypothesis that directors who have been in library service for longer periods of time are more likely than their counterparts to use the multi-frame approach than any other type of approach when dealing with change.

There was a significant and positive relationship between library type and the use of single approaches versus dual approaches. Each additional level in library type increased the likelihood of using dual approaches by 41.0%. Directors who worked for a higher academic degree college or university would be more likely to use dual approaches than their counterparts.

In terms of the use of single approaches versus dual approaches, library type would be a marginally significant predictor (significance near .10). The other variables might not have any significant impact of the directors' approaches used (significance far from .01).

Binary logistic regression was used to check whether the results would change. Table 6.35 reports binary logistic regression estimates that predict directors' approaches to conducting meetings. The estimated pseudo R^2 indicates that this set of variables/subscales explains 4.7% of the variation in the directors' approaches used. Results demonstrate that independent variables, such as years of present position, and

total years of library service, show significant impact on the outcome variables. However, the predictor of library type did not significantly influence respondents' approaches used.

Table 6.34: Multinomial Logistic Regression Estimates Predicting Approaches to Conducting Meetings (N = 455)

	Dual Approaches vs. Single Approaches		Multiple Approaches vs. Single Approaches	
Predictors	*B*	exp(*B*)	*B*	exp(*B*)
Male	-.306	.736	-.189	.828
	(.299)		(.273)	
Age	-.062	.940	-.100	.905
	(.119)		(.109)	
Education Level	-.129	.879	.004	1.005
	(.136)		(.124)	
Years of Present Position	-.042*	.959	-.045**	.956
	(.024)		(.022)	
Total Years of Directorship	.028	1.028	.009	1.007
	(.024)		(.022)	
Total Years of	.026	1.026	.037**	1.038
Library Service	(.020)		(.018)	
No. of Different	-.033	.968	.033	1.033
Positions	(.063)		(.053)	
No. of	..095	1.100	.092	1.096
Subordinates	(.139)		(.128)	
No. of Library	-.006	.994	-.009	.991
Branches	(.046)		(.043)	
Library Type	.343*	1.410	.114	1.121
	(.233)		(.212)	
Library Size	-.245	.783	-.236	.789
	(.200)		(.185)	
Constant	.503		.906	
	(.807)		(.735)	
-2 log likelihood		896.2		
Model χ^2		21.4		
Pseudo R^2		.053		
Df		22		
N		455		

Notes: The *B* is the logistic regression coefficient; exp (*B*) or odds ratio is the antilog of *B*; and standard errors are in parentheses.
*p < 0.10; **p < 0.05; ***p < 0.01; ****p < 0.001

Table 6.35: Binary Logistic Regression Estimates Predicting Approaches to Conducting Meetings (N = 455)

	Dual & Multiple Approaches vs. Single Approaches	
Predictors	*B*	exp(*B*)
Male	-.233	.792
	(.260)	
Age	-.085	.919
	(.103)	
Education Level	-.044	.957
	(.117)	
Years of Present Position	-.043**	.958
	(.021)	
Total Years of Directorship	.015	1.015
	(.021)	
Total Years of Library Service	.032*	1.033
	(.017)	
No. of Different Positions	.021	1.021
	(.051)	
No. of Subordinates	.092	1.096
	(.122)	
No. of Library Branches	-.008	.992
	(.040)	
Library Type	.198	1.218
	(.203)	
Library Size	-.237	.789
	(.175)	
Constant	1.413**	4.108
	(.699)	
-2 log likelihood		416.1
Model χ^2		13.2
Pseudo R^2		.047
Df		11
N		455

Notes: The *B* is the logistic regression coefficient; exp (*B*) or odds ratio is the antilog of *B*; and standard errors are in parentheses.

*p< 0.10; **p< 0.50; ***p < 0.01; ****p < 0.001

Table 6.36 reports the results of the multinomial logistic regression estimates that predict the directors' approaches to conducting meetings. The reference category was the structural approach. The estimated pseudo R^2 indicates that this set of variables/subscales explains 15.9% of the variation of the directors' approaches to conducting meetings. Results show that independent variables, such as years of present position, number of different positions, and number of subordinates, significantly impact the outcome variables.

There was a positive and significant relationship between total years at present position and the use of the structural approach versus symbolic approach. Each additional year in a current position increased the probability by 13.5% of using symbolic approach rather than structural approach. Directors who had been in their current positions for longer periods of time would be more likely to use the symbolic approach than those who served in their current positions for shorter periods of time.

The predictor of years at present position was also detected to be statistically negatively and significantly related to the use of structural approach versus other approaches. Each additional year in a present position decreased the likelihood by 13.7% in using other approaches rather than the structural approach. For longer periods of time directors had been in their present positions, the less likely they would be to use other approaches to conducting meetings than their counterparts.

The relationship between the number of different library professional positions and the use of structural approach versus symbolic approach was detected to be positive

and very significant. Each additional number for different positions increased the probability by 52.0% to use the symbolic approach rather than structural approach. Directors who held more professional positions would be more likely to use the symbolic approach than their counterparts.

Number of different professional positions was also detected to be positively and significantly related to the use of the structural approach versus multiple approaches. Directors who held more different positions would be about 23% more likely than their counterparts to use multiple approaches rather than the structural approach to conduct meetings. This supports the hypothesis that those who have held more different professional positions are more likely to use multiple approaches than their counterparts.

A positive and significant relationship between the number of subordinates and the use of the structural approach versus multiple approaches was detected. Directors in charge of more subordinates would be about 0.1% more likely than their counterparts to use the multi-frame approach to conduct meetings. This supports the hypothesis that those who oversee more subordinates are more likely than their counterparts to use multiple approaches while dealing with change.

In terms of using the structural approach versus dual approaches, library size was detected to be a marginally significant predictor (significance close to .10). This was also true for the relationship between library size and the structural approach versus the multi-frame approach. However, the results of other variables did not significantly impact the directors' approaches used (significance far from .10).

Table 6.36: Multinomial Logistic Regression Estimates Predicting Approaches to Conducting Meetings (N = 455)

	Human Resource vs. Structural		Symbolic vs. Structural		Other vs. Structural	
Predictors	*B*	exp(*B*)	*B*	exp(*B*)	*B*	exp(*B*)
Male	.212	1.236	-.059	.942	-.309	.734
	(.559)		(.821)		(.757)	
Age	.081	1.084	-.030	.970	.207	1.231
	(.221)		(.313)		(.324)	
Education	.255	1.290	-.409	.664	.171	1.187
	(.245)		(.443)		(.344)	
Years of Present	.054	1.055	.127**	1.135	-.147*	.863
Position	(.046)		(.060)		(.087)	
Total Years of	-.051	.950	-.013	.987	.047	1.048
Directorship	(.047)		(.064)		(.054)	
Total Years of	.016	1.017	-.059	.943	.019	1.014
Library Service	(.039)		(.054)		(.051)	
No. of Different	.172	1.188	.419***	1.520	.085	1.088
Positions	(.145)		(.144)		(.184)	
No. of	-.283	.753	-.327	.721	.540	1.715
Subordinates	(.265)		(..441)		(.410)	
No. of Library	-.072	.930	-.343	.710	.018	1.018
Branches	(.116)		(.504)		(.080)	
Library Type	-.251	.778	.368	1.445	.492	1.636
	(.440)		(.595)		(.664)	
Library Size	.049	1.050	-.323	.009	-.413	.661
	(.362)		(.000)		(.497)	
Constant	-1.912		9.695****		-5.595*	
	(1.506)		(2.220)		(2.527)	
-2 log likelihood				1050.9		
Model χ^2				71.6		
Pseudo R^2				.159		
df				55		
N				455		

Notes: The *B* is the logistic regression coefficient; exp (*B*) or odds ratio is the antilog of *B;* and standard errors are in parentheses.
*p<0.10; **p<0.50; ***p < 0.01; ****p ≤ 0.001.

Table 6.36 (continued)

Predictors	Dual vs. Structural *B*	exp(*B*)	Multiple vs. Structural *B*	exp(*B*)
Male	-.311	.733	-.192	.826
	(.399)		(.382)	
Age	-.024	.976	-.063	.939
	(.149)		(.142)	
Education	-.061	.941	.075	1.078
	(.183)		(.174)	
Years of Present Position	-.018	.982	-.020	.981
	(.035)		(.034)	
Total Years of Directorship	.022	1.022	.001	1.001
	(.033)		(.032)	
Total Years of Library Service	.021	1.021	.032	1.032
	(.027)		(.026)	
No. of Different Positions	.135	1.144	.207**	1.231
	(.114)		(.110)	
No. of Subordinates	.007	1.007	.000*	1.001
	(.184)		(.177)	
No. of Library Branches	-.020	.980	-.024	.976
	(.056)		(.053)	
Library Type	.342	1.408	.109	1.115
	(.320)		(.306)	
Library Size	-.373	.689	-.365	.694
	(.258)		(.248)	
Constant	.537		.918	
	(1.033)		(.982)	
-2 log likelihood		1050.9		
Model χ^2		71.6		
Pseudo R^2		.159		
df		55		
N		455		

Notes: The *B* is the logistic regression coefficient; exp (*B*) or odds ratio is the antilog of *B;* and standard errors are in parentheses.
*p≤0.10; **p≤0.50; ***p ≤ 0.01; ****p ≤ 0.001.

Approaches to Making Change Decisions

Question 16. How would you view decision-making if you were Frank?

Descriptive Results

As displayed in Table 6.37 below, 50.5% directors would employ multiple approaches to make change decisions if they were Colin, while 41.3% used dual approaches. The total single approaches would only be used by 8.1% of all respondents. No respondent would use single political, symbolic, or other approach to make change Decisions. No respondent checked N/A (not applicable) for each response.

The structural and human resource approaches were favored by directors choosing dual or multiple approaches. Most likely, these approaches appear together more often over the others because directors spend much of their time working with a variety of people and realigning roles and duties of staff in current academic libraries that are caught up in the mode of rapidly changing technology.

The "other" approach was noted by 23 (5.1%) respondents. Of these respondents, 12 commented on the "other approach" they would use. However, no respondents listed a true "other" approach. According to the Bolman's and Deal's model, three responses were actually the structural approach; three, political; one, symbolic; two, dual approach; and three, comments. The remaining 11 respondents did not specify what their other approaches were and therefore could not be ruled out as not actually using "other approach" category in Table 6.37. As a result, 11 respondents are included in the "other approach" category in Table 6.37.

The free comments on the "other" approach respondents used show that directors used varied approaches to make change decisions. They most often mentioned the use of the structural and political approaches. They would use decision-making as a means to have the feedback, a tool to develop insight into the problem, and a chance to influence staff views. They didn't comment on the use of the multi-frame approach in the change process.

Dependent Variables

Table 6.37 reports descriptive statistical results of the dependent variables used in the analysis. The dependent variable is the directors' approaches to making change decisions. It is made up of three main categories: (1) single approaches; (2) dual approaches; and (3) multiple approaches. The single approaches comprise two subcategories: (1) structural; and (2) human resource.

Table 6.37: Approaches Used in Response to Question 16: How Would You View Decision-making if You Were Frank? (N = 455)

Approaches Used	No. of Responses	(%)
SINGLE APPROACHES		
STRUCTURAL		
▪ Use decision-making as a rational sequence to make right change decisions	15	(3.3)
HUMAN RESOURCE		
▪ Use decision-making as an open process to produce commitment	22	(4.8)
POLITICAL		
▪ Use decision-making as an opportunity to gain or exercise power	0	(0)
SYMBOLIC		
▪ Use decision-making as a ritual to confirm values and create opportunities for bonding	0	(0)
OTHER		
▪ Use a completely different approach	0	(0)
Total Responses	37	(8.1)
DUAL APPROACHES		
▪ Structural and human resource	140	(30.8)
▪ Structural and symbolic	7	(1.5)
▪ Structural and political	4	(0.9)
▪ Human resource and symbolic	34	(7.5)
▪ Human resource and other	2	(0.4)
▪ Human resource and political	1	(0.2)
Total Responses	188	(41.3)
MULTIPLE APPROACHES		
▪ Structural, human resource, and symbolic	154	(33.8)
▪ Structural, human resource, political, and symbolic	46	(10.1)
▪ Structural, human resource, and political	20	(4.4)
▪ Structural, human resource, and other	5	(1.1)
▪ Structural, human resource, symbolic, and other	4	(0.9)
▪ Structural, political, and symbolic	1	(0.2)
Total Responses	230	(50.5)

Legend: No. Number

Results of Bivariate Crosstabulation and χ^2 Test

The bivariate cross-tabulation indicated that there were many significant associations between the independent variables and the directors' approaches to making

change decisions (Table 6.38). The chi-square test was used to check whether two nominal variables are independent from or related to each other (Sarantakos 2005, 385). The collected continuous variables were recoded as the categorical ones. The ordinal variables with more categories were also recoded for the sake of reliable results. Results indicated that demographics, human capital, and library characteristics could be used to predict respondents' approaches to making change decisions.

The results of the χ^2 tests did not detect any significant relationship between directors' approaches used and these variables: gender, age, education level, and library size at the .10 level. However, the percentage results show that females used dual and multiple approaches more to make change decisions than males. Directors who were twenty-five to thirty-nine employed dual approaches more, while directors who were sixty or more employed the multi-frame approach more. Those who obtained MA/MS not in library science and other used the single approach more, while those who got MLS plus other master's degree employed multiple approaches more. Those who worked for a college or university with less than 10,000 total student enrollment utilized dual approaches more, while those who worked for a college or university with 10,000 to 19,999 employed multiple approaches more.

The χ^2 test shows that there was a very significant relationship between directors' approaches used and library type at the .01 level. The minimum expected count is 9.19. Thus, the result can be trusted. Those who worked for a master-granting college or university were more likely to multiple approaches, while those who worked for a

baccalaureate-granting college or university were more likely to use dual approaches.

According to the results of the χ^2 tests in Table 6.38 (continued), there were no significant relationships between directors' approaches used and these predictors: years of present position, years of directorship, years of library service, number of different positions, number of subordinates, and number of library branches at the .10 level. Thus, there are no significant relationships. However, the percentage results show that directors who had been in their current positions for fewer than one year to four years used single and dual approaches more, while those for ten years or more employed multiple approaches more. Those who had been in all directorship for ten to fourteen years used the multi-frame approach more. Directors who served in libraries for thirty or more years utilized multiple approaches more, while those for fifteen to twenty-nine used dual approaches more. Those who held four to six different positions employed the multi-frame approach more, while those who held one to three different positions used single and dual approaches more. Directors who oversaw twenty to twenty-nine subordinates employed the multi-frame approach more, while those who oversaw ten to nineteen subordinates used dual approaches more. Those who did not oversee any library branch employed the multi-frame approach more to make change decisions.

Table 6.38: Percentage Distribution of Directors' Attitudes toward Approaches Used to Make Change Decisions (N = 455)

	Approaches Used (%)				
	Single	Dual	Multiple	Total	No.
Gender					
Female	7.9	39.4	52.8	100.0	(254)
Male	8.5	43.8	47.8	100.0	(201)
$\chi2 = 1.129$, df = 2, p = .569					
Age					
25–39	7.7	46.2	46.2	100.0	(26)
40-59	9.2	40.3	50.5	100.0	(283)
60 or more	6.2	42.5	51.4	100.0	(146)
$\chi2 = 1.475$, df = 4, p = .831					
Education Level					
MA/MS not in Library Science & Other	11.1	38.9	50.0	100.0	(18)
MLS	10.2	41.8	48.0	100.0	(177)
MLS plus other master's degree	5.0	41.6	53.4	100.0	(161)
PhD	9.1	40.4	50.5	100.0	(99)
$\chi2 = 3.739$, df = 6, p = .712					
Type of Institution					
Baccalaureate-granting	5.3	53.1	41.6	100.0	(113)
Master-granting	7.6	33.0	59.5	100.0	(185)
Doctoral-granting	10.8	42.7	46.5	100.0	(157)
$\chi2 = 14.774$, df = 4, p = .005					
Total Student Enrollment					
<10,000	7.0	41.6	51.4	100.0	(329)
10,000–19,999	6.2	40.0	53.8	100.0	(65)
20,000 or more	16.4	41.0	42.6	100.0	(61)
$\chi2 = 6.938$, df = 4, p = .139					
Total	8.1	41.3	50.5	100.0	
No.	(37)	(188)	(230)	(455)	

Legend: No. = Number

Table 6.38 (continued)

	Approaches Used (%) Single	Dual	Multiple	Total	No.
Years of Present Position					
0 - 4	9.6	45.5	44.9	100.0	(167)
5 - 9	6.3	40.3	53.5	100.0	(144)
10 or more	8.3	37.5	54.2	100.0	(144)
$\chi2 = 3.988$, df = 4, p = .408					
Years of All Directorship					
0 - 4	8.3	49.1	42.6	100.0	(108)
5 - 9	9.6	38.3	52.2	100.0	(115)
10 - 14	6.3	35.4	58.2	100.0	(79)
15 or more	7.8	41.2	51.0	100.0	(153)
$\chi2 = 5.460$, df = 6, p = .486					
Years of Library Services					
0 - 14	10.7	37.5	51.8	100.0	(56)
15 - 29	9.3	44.2	46.5	100.0	(172)
30 or more	6.6	40.1	53.3	100.0	(227)
$\chi2 = 2.933$, df = 4, p = .569					
Number of Different Positions					
0 - 3	9.2	41.8	49.0	100.0	(153)
4 - 6	7.2	41.1	51.7	100.0	(207)
7 or more	8.4	41.1	50.5	100.0	(95)
$\chi2 = .543$, df = 4, p = .969					
Number of Subordinates					
1 - 9	10.9	44.5	44.5	100.0	(128)
10 - 19	7.3	45.5	47.2	100.0	(123)
20 - 29	3.1	40.0	56.9	100.0	(65)
30 or more	8.6	35.3	56.1	100.0	(139)
$\chi2 = 8.109$, df = 6, p = .230					
Number of Library Branches					
0	6.1	39.6	54.3	100.0	(164)
1	7.2	44.3	48.5	100.0	(167)
2 or more	12.1	39.5	48.4	100.0	(124)
$\chi2 = 4.690$, df = 4, p = .321					
Total	8.1	41.3	50.5	100.0	
No.	(37)	(188)	(230)	(455)	

Legend: No. = Number

Results of Correlations

As shown in Table 6.39 below, there are many significant bivariate correlations among the variables used in the analysis.

Correlations between Independent Variables and Dependent Variables

The results of this study coincided with the hypotheses presented earlier regarding the use of multiple approaches (Table 6.39). However, calculated r values for the variables were < .30, making the correlations very weak or low rather than moderate or strong. In this study, there was no significant association between gender and directors' multiple approaches used. Correlations between the variables of total years of directorship, total years of library service, and number of subordinates and the use of multiple approaches were respectively detected to be positive and significant. Directors who had been in directorship, or served in libraries for longer periods of time, or oversaw more subordinates, were more likely to use multiple approaches to make change decisions than their counterparts. However, the study results contradicted the hypothesis that directors who worked at universities with higher enrollment would choose multiple approaches.

The variables of number of library branches, library type, and library size were respectively detected to be negatively and significantly correlated with the use of dual and multiple approaches. Directors who oversaw more library branches, or worked at a large school or library, or at universities with higher enrollment were less likely than their counterparts to use dual and multiple approaches to make change decisions. However, the

correlations between the variables of age and total years of library service and the use of dual and multiple approaches were respectively detected to be positive and significant. Directors who were older, or worked in libraries for longer periods of time, were more likely than their counterparts to use dual and multiple approaches to make change decisions.

The variables of number of library branches and library size were respectively detected to be positively and significantly correlated with the structural approach. The structural approach was more likely to be used by directors who oversaw more library branches, or worked at universities with higher enrollment. However, older directors were less likely to use the structural approach to make change decisions than younger ones.

The human resource approach was more likely to be used by directors who worked at universities with higher enrollment. However, directors who had been in their current positions, or worked in libraries for longer periods of time were less likely to use the human resource approach to make change decisions than their counterparts.

Directors who were older, or served in libraries for longer periods of time were less likely to use single approaches to view change decision-making than their counterparts. However, single approaches were more likely to be used by directors who oversaw more library branches, or worked at a large school or library, or at universities with higher enrollment. Directors who oversaw more subordinates, or worked at a large

library or school were less likely than their counterparts to use dual approaches to view change decision-making.

Table 6.39: Correlation Matrix for Variables Used in the Analysis (N = 455)

Approaches to Making Change Decisions

	A	B	C	D	E	F
1	.009	.006	.011	.044	-.050	-.011
2	-.064*	-.052	-.083**	-.008	.053	.083**
3	-.049	.012	-.022	-.009	.021	.022
4	.045	-.061*	-.019	-.045	.055	.019
5	-.059	-.005	-.043	-.046	.069*	.043
6	-.022	-.062*	-.063*	-.033	.067*	.063*
7	.003	-.030	-.022	.035	-.023	.022
8	-.042	-.012	-.037	-.082**	.101**	.037
9	.182****	.056	.163****	-.048	-.042	-.163****
10	.057	.052	.078**	-.065*	.022	-.078**
11	.068*	.088**	.114***	-.001	-.061*	-.114***

Notes: A=Structural, B=Human Resource, C=Single, D=Dual, E=Multiple, F=Single Approaches vs. Dual & Multiple Approaches
1=Male, 2=Age, 3=Education, 4=Years at Present Position, 5=Total Years of Directorship, 6=Total Years of Library Service, 7=No. of Different Positions, 8=No. of Subordinates, 9=No. of Library Branches, 10=Library Type, 11=Library Size
*$p \leq 0.10$; **$p \leq 0.05$; ***$p \leq 0.01$; ****$p \leq 0.001$

Results of Multinomial and Binary Logistic Regressions

The hypotheses of this study focus on directors' use of multiple approaches versus single approaches. Thus, "single approaches" is used as the reference category. Table 6.40 reports the multinomial logistic regression estimates that predict directors'

approaches to making change decisions. The estimated pseudo R^2 displays that this set of variables/subscales explains 7.2% of the variation in the directors' approaches used. The results show that the predictors, such as number of subordinates and number of library branches, significantly impact the outcome variables.

There was a positive and significant relationship between number of subordinates and single approaches versus multiple approaches. Each additional level in number of subordinates increased the likelihood by 44.8% in using multiple approaches rather than single approaches. Directors who oversaw more subordinates would be more likely to use multiple approaches to make change decisions than their counterparts. This supports the hypothesis that directors who oversee more subordinates are more likely than their counterparts to utilize the multi-frame approach while managing change.

The relationship between number of branches and the use of single approaches versus dual approaches was detected to be negative and significant. Each additional number of library branches decreased the likelihood by 0.9% in using dual approaches to make change decisions. Those who oversaw more library branches were less likely to use dual approaches than their counterparts. Number of branches was also noted to be negatively and significantly related to the use of single approaches versus multiple approaches. Each additional number of library branches decreased the likelihood by 8.2% in using multiple approaches rather than single approaches. The more library branches directors oversaw, the less likely they were to use multiple approaches to make change decisions than their counterparts. This rejects the hypothesis that directors who oversee

more subordinates are more likely than their counterparts to use the multi-frame approach while dealing with change.

In terms of the use of single approaches versus dual approaches, library type was detected to be a marginally significant predictor (significance near .10). However, the other variables might not have any significant impact of the directors' approaches used (significance far from .01).

Binary logistic regression was used to check whether the results would change. Table 6.41 displays binary logistic regression estimates that predict directors' approaches to making change decisions. The estimated pseudo R^2 indicates that this set of variables/subscales explains 8.6% of the variation in the directors' approaches used. Results demonstrate that number of library branches, independent variable, still shows significant impact on the outcome variables.

Table 6.40: Multinomial Logistic Regression Estimates Predicting Approaches to Making Change Decisions (N = 455)

	Dual Approaches vs. Single Approaches		Multiple Approaches vs. Single Approaches	
Predictors	*B*	exp(*B*)	*B*	exp(*B*)
Male	.093	1.097	-.222	.801
	(.387)		(.384)	
Age	.199	1.220	.171	1.186
	(.148)		(.146)	
Education Level	.016	1.016	.013	1.014
	(.181)		(.179)	
Years of Present Position	-.024	.976	-.017	.983
	(.034)		(.033)	
Total Years of Directorship	.005	1.005	.013	1.013
	(.032)		(.031)	
Total Years of	.002	1.002	..008	1.008
Library Service	(.027)		(.027)	
No. of Different	.038	1.039	-.002	.998
Positions	(.084)		(.085)	
No. of	.171	1.187	.370**	1.448
Subordinates	(.181)		(.180)	
No. of Library	-.094**	.910	-.085*	.918
Branches	(.046)		(.044)	
Library Type	-.449	.639	-.301	.740
	(.313)		(.310)	
Library Size	-.074	.929	-.290	.748
	(.235)		(.236)	
Constant	1.048		.951	
	(1.000)		(.992)	
-2 log likelihood		803.3		
Model χ^2		28.5		
Pseudo R^2		.072		
Df		22		
N		455		

Notes: The *B* is the logistic regression coefficient; exp (*B*) or odds ratio is the antilog of *B;* and standard errors are in parentheses.
*p≤0.10; **p ≤ 0.05; ***p ≤ 0.01; ****p ≤ 0.001

Table 6.41: Binary Logistic Regression Estimates Predicting Approaches to Making Change Decisions (N = 455)

	Dual & Multiple Approaches vs. Single Approaches	
Predictors	*B*	exp(*B*)
Male	-.078	.925
	(.370)	
Age	.184	1.202
	(.141)	
Education Level	.014	1.014
	(.174)	
Years of Present Position	-.022	.980
	(.033)	
Total Years of Directorship	.009	1.009
	(.030)	
Total Years of Library Service	.005	1.005
	(.026)	
No. of Different Positions	.017	1.017
	(.081)	
No. of Subordinates	.277	1.320
	(.174)	
No. of Library Branches	-.089**	.914
	(.040)	
Library Type	-.365	.694
	(.301)	
Library Size	-.186	.830
	(.223)	
Constant	1.690*	5.420
	(.953)	
-2 log likelihood		239.4
Model χ^2		17.2
Pseudo R^2		.086
Df		11
N		455

Notes: The *B* is the logistic regression coefficient; exp (*B*) or odds ratio is the antilog of *B;* and standard errors are in parentheses.

*p≤0.10; **p≤0.50; ***p ≤ 0.01; ****p ≤ 0.001

Taking into account the independent variables used in this study, Table 6.42 reports on the multinomial logistic regression estimates that predict the directors' approaches to managing change decisions. As a reference category, the human resource approach was used more often than any other single approach. The estimated pseudo R^2 indicates that this set of variables/subscales explains 11.0% of the variation of the directors' approaches to making change decisions. Results show that independent variables, such as years at present position, total years of directorship, and number of library branches, significantly impact the outcome variables.

There was a positive and very significant relationship between years of present position and use of the human resource approach versus structural approach. Directors in their current positions for longer periods of time were more likely than their counterparts to use the structural approach. For each additional year in a present position, this likelihood increased by 22.2%.

A negative and significant correlation was noted between the total years of directorship and the use of the human resource approach versus structural approach. Each additional year in directorship decreased the likelihood by 15.7% in using the structural approach rather than human resource approach. Directors in directorship for longer periods of time were less likely than their counterparts to use the structural approach to make change decisions.

There was a positive and significant relationship between the number of library branches and the use of the human resource versus structural approach. Each additional

number of library branches increased the likelihood by 13.9% of using the structural approach rather than human resource approach. The more library branches directors oversaw, the more likely they were to use the structural approach to make change decisions than their counterparts.

In terms of using the human resource approach versus multiple approaches, library size was detected to be a marginally significant predictor (significance close to .10). This was also true for the relationship between total years of directorship and use of the human resource approach versus dual approaches. However, the results of other variables did not significantly impact the directors' approaches used (significance far from .10).

Table 6.42: Multinomial Logistic Regression Estimates Predicting Approaches to Making Change Decisions (N = 455)

	Structural vs. Human Resource		Dual vs. Human Resource		Multiple vs. Human Resource	
Predictors	*B*	exp(*B*)	*B*	exp(*B*)	*B*	exp(*B*)
Male	.276	1.456	.247	1.280	-.069	.933
	(.735)		(.479)		(.475)	
Age	-.174	.840	.131	1.140	.104	1.109
	(.280)		(.176)		(.175)	
Education	.221	.801	-.011	.989	-.013	.988
	(.353)		(.224)		(.222)	
Years of Present	.200***	1.222	.058	1.060	.065	1.067
Position	(.064)		(.046)		(.045)	
Total Years of	-.171***	.843	-.053	.948	-.045	.956
Directorship	(.063)		(.036)		(.035)	
Total Years of	.031	1.031	.017	1.017	.024	1.024
Library Service	(.052)		(.033)		(.033)	
No. of Different	.091	1.095	.082	1.085	.042	1.043
Positions	(.164)		(.114)		(.114)	
No. of	-.275	.759	-.061	1.063	.260	1.297
Subordinates	(.358)		(.217)		(.216)	
No. of Library	.130*	1.139	-.045	.956	-.037	.964
Branches	(.074)		(.060)		(.058)	
Library Type	.378	1.460	-.284	.753	-.138	.872
	(.601)		(.390)		(.388)	
Library Size	-.393	.675	-.228	.796	-.444	.642
	(.454)		(.279)		(.280)	
Constant	.246		1.523		1.425	
	(1.915)		(1.236)		(1.230)	
-2 log likelihood				836.7		
Model χ^2				45.1		
Pseudo R^2				.110		
df				33		
N				455		

Notes: The *B* is the logistic regression coefficient; exp (*B*) or odds ratio is the antilog of *B*; and standard errors are in parentheses.
*p < 0.10; **p < 0.50; ***p < 0.01; ****p < 0.001

Approaches to Evaluating Change

Question 17. How would you view evaluation if you were Frank?

Descriptive Results

As shown in Table 6.43 below, 41.3% directors would employ dual approaches to evaluate change if they were Colin, while 22.2% used multiple approaches. The total single approaches would be used by 36.5% of all respondents. No respondent would use single political, symbolic, and other approach to evaluate change. No respondent checked N/A (not applicable) for each response.

The structural and human resource approaches were favored by directors choosing dual or multiple approaches. Most likely, these approaches appear together more often over the others because directors spend much of their time working with a variety of people and realigning roles and duties of staff in current academic libraries.

The "other" approach was noted by 28 (6.2%) respondents. Of these respondents, 10 commented on the "other approach" they would use. However, no respondent listed a true "other" approach. According to the Bolman's and Deal's model, four responses were actually the structural approach; and six, human resource approach. The remaining 18 respondents did not specify what their other approaches were and therefore could not be ruled out as not actually using "other approach" category in Table 6.43. As a result, 18 respondents are included in the "other approach" category in Table 6.43.

The free comments on the "other" approach respondents used show that directors used the human resource and structural approaches more often than other approaches.

They used evaluations as a basis for setting goals, a change to solicit individual's true feelings, and to promote staff in the change process.

Dependent Variables

Table 6.43 shows descriptive statistical results of the dependent variables used in the analysis. The dependent variable is the directors' approaches to evaluating change. It comprises three main categories: (1) single approaches; (2) dual approaches; and (3) multiple approaches. The single approaches consist of two subcategories: (1) structural; and (2) human resource.

Table 6.43: Approaches Used in Response to Question 17: How Would You View Evaluation if You Were Frank? (N = 455)

Approaches Used	No. of Responses	(%)
SINGLE APPROACHES		
STRUCTURAL		
▪ Use evaluation as a basis for distributing rewards or penalties to control change performance	10	(2.2)
HUMAN RESOURCE		
▪ Use evaluation as a process for helping individuals grow and improve	156	(34.3)
POLITICAL		
▪ Use evaluation as an opportunity to score points with the staff	0	(0)
SYMBOLIC		
▪ Use evaluation as an occasion to play roles in shared rituals	0	(0)
OTHER		
▪ Use a completely different approach	0	(0)
Total Responses	166	(36.5)
DUAL APPROACHES		
▪ Structural and human resource	99	(21.8)
▪ Human resource and symbolic	76	(16.7)
▪ Human resource and other	8	(1.8)
▪ Human resource and political	5	(1.1)
Total Responses	188	(41.3)
MULTIPLE APPROACHES		
▪ Structural, human resource, and symbolic	60	(13.2)
▪ Structural, human resource, and political	20	(4.4)
▪ Structural, human resource, political, and symbolic	8	(1.8)
▪ Structural, human resource, and other	6	(1.3)
▪ Structural, political, and symbolic	3	(0.7)
▪ Human resource, symbolic, and other	4	(0.9)
Total Responses	101	(22.2)

Legend: No. Number

Results of Bivariate Crosstabulation and χ^2 Test

The bivariate cross-tabulation indicated that there were many significant associations between the independent variables and the directors' approaches to evaluating change (Table 6.44). The chi-square test was used to check whether two

nominal variables are independent from or related to each other (Sarantakos 2005, 385). The collected continuous variables were recoded as the categorical ones. The ordinal variables with more categories were also recoded for the sake of reliable results. Results indicated that demographics, human capital, and library characteristics could be used to predict respondents' approaches to evaluating change.

The χ^2 tests displayed no significant relationships between directors' approaches used and these predictors: gender, age, and education level at the .10 level. Thus, there are no significant relationships. However, the percentage results show that males employed multiple approaches more to evaluate change than females. Directors who were twenty five to thirty-nine utilized single approaches more, while directors who were sixty or more used the multi-frame approach more. Those who obtained MA/MS not in library science and other utilized the multi-frame approach more, while those who got MLS used dual approaches more.

The χ^2 test shows that there was a very significant relationship between directors' approaches used and library type at the .01 level. The minimum expected count is 25.08. Thus, the result can be trusted. Those who worked for a baccalaureate-granting college or university were more likely to use the single approach to evaluate change, while those who worked for a doctoral-granting college or university were more likely to use the multi-frame approach. This supports the hypothesis that directors who work for a higher academic degree college or university are more likely than their counterparts to use the multi-frame approach while managing change.

The χ^2 test detected a very significant relationship between directors' approaches used and library size at the .10 level. The minimum expected count is 13.54. The result can be trusted. Those who worked for a college or university with less than 10,000 total student enrollment were more likely to use single and dual approaches, while those who worked for a college or university with 20,000 or more were more likely to use multiple approaches to evaluate change. This supports the hypothesis that directors with more enrollments are more likely to use the multi-frame approach to manage change than their counterparts.

In Table 6.44 (continued) below, the χ^2 detected significant difference between directors' approaches used and total years of present position at the .05 level. The minimum expected count is 31.96. The result can be trusted. Directors who had been in their current positions for five to nine years were more likely to use the multi-frame approach to evaluate change, while those for ten years or more were more likely to use dual approaches.

According to the results of the χ^2 tests, there were no significant relationships between directors' approaches and these variables: years of directorship, years of library service, number of different positions, and number of library branch at the .10 level. There are no significant relationships. However, the percentage results display that those who had been in all directorship for fewer than one year to four years employed single and multiple approaches more, while those for ten to fourteen years used dual approaches more. Directors who served in libraries for fewer than one year to fourteen years

employed multiple approaches more, while those for fifteen to twenty-nine utilized single and dual approaches more. Those who held four to six different positions used the multi-frame approach more, while those who held seven or more different positions employed dual approaches more. Those who oversaw two or more library branches employed the dual and multi-frame approach more, while those who did not oversee any library branch used single approaches more.

The χ^2 test detected a significant relationship between directors' approaches to evaluating change and number of subordinates at .05 level. The minimum expected count is 14.43. The result can be trusted. Directors who oversaw thirty or more subordinates were more likely than their counterparts to use the dual and multi-frame approach. This supports the hypothesis that directors who oversee more subordinates are more likely than their counterparts to use the multi-frame approach to manage change.

Table 6.44: Percentage Distribution of Directors' Attitudes toward Approaches Used to Evaluate Change (N = 455)

	Approaches Used (%)				
	Single	Dual	Multiple	Total	No.
Gender					
Female	37.0	44.1	18.9	100.0	(254)
Male	35.8	37.8	26.4	100.0	(201)
$\chi2 = 3.937$, df = 2, p = .140					
Age					
25–39	46.2	34.6	19.2	100.0	(26)
40-59	36.0	42.0	21.9	100.0	(283)
60 or more	35.6	41.1	23.3	100.0	(146)
$\chi2 = 1.225$, df = 4, p = .874					
Education Level					
MA/MS not in Library Science & Other	27.8	38.9	33.3	100.0	(18)
MLS	35.6	44.6	19.8	100.0	(177)
MLS plus other master's degree	37.9	41.6	20.5	100.0	(161)
PhD	37.4	35.4	27.3	100.0	(99)
$\chi2 = 4.706$, df = 6, p = .582					
Type of Institution					
Baccalaureate-granting	41.6	40.7	17.7	100.0	(113)
Master-granting	39.5	43.8	16.8	100.0	(185)
Doctoral-granting	29.3	38.9	31.8	100.0	(157)
$\chi2 = 14.075$, df = 4, p = .007					
Total Student Enrollment					
<10,000	39.8	42.6	17.6	100.0	(329)
10,000–19,999	26.2	41.5	32.3	100.0	(65)
20,000 or more	29.5	34.4	36.1	100.0	(61)
$\chi2 = 15.912$, df = 4, p = .003					
Total	36.5	41.3	22.2	100.0	
No.	(166)	(188)	(101)	(455)	

Legend: No. = Number

Table 6.44 (continued)

	Approaches Used (%) Single	Dual	Multiple	Total	No.
Years of Present Position					
0 - 4	44.3	33.5	22.2	100.0	(167)
5 - 9	30.6	43.8	25.7	100.0	(144)
10 or more	33.3	47.9	18.8	100.0	(144)
$\chi^2 = 10.321$, df = 4, p = .035					
Years of All Directorship					
0 - 4	39.8	35.2	25.0	100.0	(108)
5 - 9	35.7	40.0	24.3	100.0	(115)
10 - 14	32.9	49.4	17.7	100.0	(79)
15 or more	36.6	42.5	20.9	100.0	(153)
$\chi^2 = 4.396$, df = 6, p = .623					
Years of Library Services					
0 - 14	35.7	37.5	26.8	100.0	(56)
15 - 29	40.7	42.4	16.9	100.0	(172)
30 or more	33.5	41.4	25.1	100.0	(227)
$\chi^2 = 5.264$, df = 4, p = .261					
Number of Different Positions					
0 - 3	40.5	39.9	19.6	100.0	(153)
4 - 6	37.2	39.1	23.7	100.0	(207)
7 or more	28.4	48.4	23.2	100.0	(95)
$\chi^2 = 4.588$, df = 4, p = .332					
Number of Subordinates					
1 - 9	37.5	43.0	19.5	100.0	(128)
10 - 19	45.5	34.1	20.3	100.0	(123)
20 - 29	40.0	41.5	18.5	100.0	(65)
30 or more	25.9	46.0	28.1	100.0	(139)
$\chi^2 = 12.813$, df = 6, p = .046					
Number of Library Branches					
0	40.2	40.9	18.9	100.0	(164)
1	36.5	39.5	24.0	100.0	(167)
2 or more	31.5	44.4	24.2	100.0	(124)
$\chi^2 = 3.168$, df = 4, p = .530					
Total	36.5	41.3	22.2	100.0	
No.	(166)	(188)	(101)	(455)	

Legend: No. = Number

Results of Correlations

In Table 6.45 below, bivariate correlations show that there are many significant correlations between the independent variables and the directors' approaches to evaluating change.

Correlations between Independent Variables and Dependent Variables

The results of this study coincided with some hypotheses presented earlier regarding the use of multiple approaches (Table 6.45). However, calculated r values for the variables were < .30, making the correlations very weak or low rather than moderate or strong. In this study, there was no significant association between gender and directors' multiple approaches used. Correlations between the variables of number of subordinates, library type and size, and the use of multiple approaches were respectively detected to be positive and significant. Directors who oversaw more subordinates, or worked at a large school or library, or at universities with higher enrollment, were more likely to use multiple approaches to evaluate change than their counterparts. Similar variables and weak correlations were also noted for directors who used both dual and multiple approaches. However, the study results contradicted the hypothesis that there is no significant difference between gender and directors' approaches used. The correlation indicated that males were more likely to use multiple approaches to evaluate change than females.

The variables of age, number of different positions, and number of library branches were also respectively detected to be positively and significantly correlated with

the use of dual and multiple approaches. Directors who were older, or held more different professional positions, or oversaw more library branches, were more likely than their counterparts to use dual and multiple approaches to evaluate change.

The variables of years at present position, total years of directorship, and number of different positions were respectively detected to be negatively and significantly correlated with the structural approach. The structural approach was less likely to be used by directors who had been in their current positions or all the directorship for longer periods of time, or held more different positions.

The variables of education level, number of different positions, number of subordinates, number of library branches, library type, and library size were detected to be negatively and significantly correlated with the human resource approach. Similar variables and weak correlations were also noted for directors who used single approaches. Directors, who were more educated, held more different positions, oversaw more subordinates or library branches, or work at a large school or library, or at universities with higher enrollment were less likely than their counterparts to use the human resource approach or single approaches to view the evaluation of change. The human resource approach was more likely to be used by directors who worked at universities with higher enrollment.

Directors who held more different positions were more likely to use dual approaches to view evaluation of change than their counterparts. However, dual

approaches were less likely to be used by directors who worked at universities with higher enrollment.

Table 6.45: Correlation Matrix for Variables Used in the Analysis (N = 455)

Approaches to Evaluating Change	A	B	C	D	E	F
1	-.013	.001	-.012	-.054	.089**	.012
2	-.008	-.074*	-.072*	.035	.035	.072*
3	-.026	.039	.031	-.049	.022	-.031
4	-.068*	-.003	-.018	.051	-.041	.018
5	-.076*	.009	-.010	.036	-.043	.010
6	-.022	-.016	-.020	-.008	.024	.020
7	-.067*	-.068*	-.091**	.112***	-.029	.091**
8	-.047	-.092**	-.109***	.042	.077*	.109***
9	-.010	-.062*	-.063*	.029	.037	.063*
10	-.058	-.091**	-.102**	-.024	.140****	.102**
11	.038	-.100**	-.072*	-.083**	.163****	.072*

Notes: A=Structural, B=Human Resource, C=Single, D=Dual, E=Multiple,
F=Single Approaches vs. Dual & Multiple Approaches
1=Male, 2=Age, 3=Education, 4=Years at Present Position, 5=Total Years of Directorship,
6=Total Years of Library Service, 7=No. of Different Positions, 8=No. of Subordinates,
9=No. of Library Branches, 10=Library Type, 11=Library Size
*p< 0.10; **p < 0.05; ***p < 0.01; ****p≤0. 001

Results of Multinomial and Binary Logistic Regressions

The hypotheses of this study focus on directors' use of multiple approaches versus single approaches. Thus, "single approaches" is used as the reference category. Table 6.46 reports the multinomial logistic regression estimates that predict directors'

approaches to evaluating change. The estimated pseudo R^2 displays that this set of variables/subscales explains 9.4% of the variation in the directors' approaches used. The results show that independent variables—total years of library service, and number of different professional positions—significantly impact the outcome variables.

A significant and negative relationship between the total years of library service and the use of single approaches versus dual approaches was detected. Each additional year of library service decreased the likelihood of using dual approaches rather than single approaches by 3.1%. Those who had more years of library service were less likely to use dual approaches than those who served in libraries for shorter periods of time.

The relationship between the number of different library professional positions and the use of single approaches versus dual approaches was detected to be positive and significant. Directors who held more professional positions would be more likely than their counterparts to use dual approaches to evaluate change. For each additional number of different positions, this likelihood increased by 13.3%.

The relationship between number of subordinates and the use of single approaches versus dual approaches was detected to be marginally significant (significance near .10). The other variables might not have any significant impact of the directors' approaches used (significance far from .10).

Binary logistic regression was used to check whether the results would change. Table 6.47 reports binary logistic regression estimates that predict directors' approaches to evaluating change. The estimated pseudo R^2 indicates that this set of

variables/subscales explains 4.3% of the variation in the directors' approaches used. Results demonstrate that the predictor of the number of different positions still shows significant impact on the outcome variables. However, the predictor, total years of library service, did not significantly influence respondents' approaches used.

Table 6.46: Multinomial Logistic Regression Estimates Predicting Approaches to Evaluating Change (N = 455)

	Dual Approaches vs. Single Approaches		Multiple Approaches vs. Single Approaches	
Predictors	*B*	exp(*B*)	*B*	exp(*B*)
Male	-.116	.891	.433	1.542
	(.229)		(.270)	
Age	.108	1.114	.106	1.112
	(.094)		(.113)	
Education Level	-.143	.867	-.090	.914
	(.105)		(.123)	
Years of Present Position	.022	1.023	.006	1.006
	(.019)		(.023)	
Total Years of Directorship	.007	1.007	-.020	.980
	(.017)		(.021)	
Total Years of	-.031*	.969	-.001	.999
Library Service	(.017)		(.021)	
No. of Different	.125**	1.133	-.024	.976
Positions	(.055)		(.069)	
No. of	.159	1.173	.124	1.132
Subordinates	(.107)		(.124)	
No. of Library	.030	1.030	-.015	.986
Branches	(.041)		(.047)	
Library Type	.112	1.118	.291	1.337
	(.175)		(.212)	
Library Size	-.195	.825	.259	1.296
	(.171)		(.174)	
Constant	-.425		-2.037***	
	(.624)		(.757)	
-2 log likelihood		931.8		
Model χ^2		39.4		
Pseudo R^2		.094		
Df		22		
N		455		

Notes: The *B* is the logistic regression coefficient; exp (*B*) or odds ratio is the antilog of *B*; and standard errors are in parentheses.
*p < 0.10; **p < 0.05; ***p < 0.01; ****p < 0.001

Table 6.47: Binary Logistic Regression Estimates Predicting Approaches to Evaluating Change (N = 455)

	Dual & Multiple Approaches vs. Single Approaches	
Predictors	*B*	exp(*B*)
Male	.081	1.085
	(.208)	
Age	.112	1.119
	(.086)	
Education Level	-.128	.879
	(.096)	
Years of Present Position	.017	1.017
	(.017)	
Total Years of Directorship	-.003	.997
	(.016)	
Total Years of Library Service	-.022	.978
	(.016)	
No. of Different Positions	.079*	1.083
	(.049)	
No. of Subordinates	.142	1.153
	(.096)	
No. of Library Branches	.011	1.011
	(.038)	
Library Type	.175	1.191
	(.160)	
Library Size	.004	1.004
	(.147)	
Constant	-.357	.700
	(.566)	
-2 log likelihood		582.4
Model χ^2		14.7
Pseudo R^2		.043
Df		11
N		455

Notes: The *B* is the logistic regression coefficient; exp (*B*) or odds ratio is the antilog of *B*; and standard errors are in parentheses.

*p≤0.10; **p≤0.50; ***p ≤ 0.01; ****p ≤ 0.001

Taking into account the independent variables used in this study, Table 6.48 reports on the multinomial logistic regression estimates that predict the directors' approaches to evaluating change. As a reference category, the human resource approach was used more often than any other single approach. The estimated pseudo R^2 indicates that this set of variables/subscales explains 12.4% of the variation of the directors' approaches. Results show that independent variables, such as male, number of different positions, library type, and library size, significantly impact the outcome variables.

The predictor of male was positively and significantly related to the probability of using the human resource approach versus multiple approaches. Males would be about 57% more likely than females to use multiple approaches to evaluate change. This rejects the hypothesis that females are more likely than males to use multiple approaches to manage change.

The relationship between the number of different library professional positions and the use of the human resource approach versus structural approach was detected to be negative and significant. Directors who held more professional positions would be less likely to use the structural approach than their counterparts. For each additional number of different positions, this likelihood decreased by 42%.

The number of different library professional positions was also noted to be positively and significantly related to the use of the human resource approach versus dual approaches. Each additional number of different positions increased the likelihood by 11.2% of using dual approaches to evaluate change. Directors who held more

professional positions would be more likely than their counterparts to use dual approaches to evaluate change.

Library type was detected to be negatively and significantly related to the use of the human resource approach versus the structural approach. Each additional level for library type decreased the likelihood by 66.1% of using the structural approach rather than the human resource approach to evaluate change. Directors who worked at research libraries were less likely to use the structural approach to evaluate change than their counterparts.

There was a positive and significant relationship between library size and the use of the human resource approach versus structural approach. Directors who worked for a college or university with higher enrollment would be about 2.9 times as likely as their counterparts to use the structural approach to evaluate change.

Library size was also detected to be positively and significantly related to the use of the human resource approach versus multiple approaches. Each additional level in library size increased the likelihood by 37.8% of using multiple approaches rather than the human resource approach. Those who worked in a college or university with higher enrollment would be more likely than their counterparts to use the multi-frame approach to evaluate change. This supports the hypothesis that directors who work for a college or university with more enrollment are more likely than their counterparts to use multiple approaches while managing change.

In terms of using the human resource approach versus dual approaches, the total

years of library service was detected to be a marginally significant predictor (significance close to .10). However, the results of other variables did not significantly impact the directors' approaches used (significance far from .10).

Table 6.48: Multinomial Logistic Regression Estimates Predicting Approaches to Evaluating Change (N = 455)

	Structural vs. Human Resource		Dual vs. Human Resource		Multiple vs. Human Resource	
Predictors	*B*	exp(*B*)	*B*	exp(*B*)	*B*	exp(*B*)
Male	.129	1.138	.103	.903	.448*	1.565
	(.720)		(.232)		(.274)	
Age	.230	1.259	.123	1.131	.123	1.131
	(.283)		(.095)		(.114)	
Education	-.006	.994	-.149	.861	-.098	.907
	(.334)		(.107)		(.125)	
Years of Present	-.096	.909	.018	1.019	.001	1.001
Position	(.085)		(.019)		(.023)	
Total Years of	-.068	.934	.003	1.003	-.024	.976
Directorship	(.064)		(.018)		(.021)	
Total Years of	.059	1.060	-.029	.972	.002	1.002
Library Service	(.052)		(.018)		(.021)	
No. of Different	-.545**	.580	.106**	1.112	-.047	.954
Positions	(.261)		(.054)		(.070)	
No. of	-.050	.951	.154	1.167	.118	1.126
Subordinates	(.317)		(.109)		(.126)	
No. of Library	-.030	.970	.027	1.028	-.017	.984
Branches	(.158)		(.041)		(.047)	
Library Type	-1.080*	.339	.067	1.069	.240	1.271
	(.596)		(.178)		(.216)	
Library Size	1.060**	2.887	-.135	.873	.321*	1.378
	(.483)		(.175)		(.179)	
Constant	-1.754		-.321		-1.921**	
	(1.857)		(.632)		(.766)	
-2 log likelihood				992.9		
Model χ^2				53.8		
Pseudo R^2				.124		
df				33		
N				455		

Notes: The *B* is the logistic regression coefficient; exp (*B*) or odds ratio is the antilog of *B;* and standard errors are in parentheses.
*p≤ 0.10; **p≤ 0.50; ***p ≤ 0.01; ****p ≤ 0.001.

CHAPTER VII

CONCLUSIONS

This study examined how academic library directors actually managed change and what factors influenced their approaches to change management. The study framework was presented and tested using the quantitative and qualitative collected data. This chapter briefly summarizes the major findings, discusses the integration of approaches for practice of change management and the implications, and finally, suggests future research needs.

Summary of the Findings

Today, there is an increasing need for academic libraries to perform change projects in response to external and internal pressures. Because academic library directors play a key role in managing change, there is a need for research on the approaches used to manage change and the impact that directors' demographic and human capital data have on choosing these approaches, as shown in Chapter II.

To explain directors' change management use variation, Chapter III presented a study framework, which was tested using the quantitative and qualitative collected data from survey questions. The qualitative data from responses to open-ended questions about how to manage change were first analyzed using content analysis. Then, the collected quantitative and qualitative data were analyzed using descriptive statistics,

including frequencies, percentages, means, standard deviations, and inferential statistics, including bivariate crosstabulations, chi-square tests, correlations, binary and multinomial logistic regressions. The results reveal many important findings.

Most directors managed both planned and unplanned change. None of the directors managed the multiple types of change. Directors used varied approaches such as structural, human resource, political, symbolic, and in-source approach to manage change with respect to what approaches they had used to manage change. In terms of approaches used to manage change in different library areas, the structural approach was used most often in managing change in information technology and library personnel. The human resource approach was used in all areas of the library. Most responses were noted in information technology and library personnel. The political and symbolic approaches were used frequently in library personnel. The directors utilized multiple approaches when managing change more than other approaches. Directors assessed the effectiveness of change management using numerous dual and multiple methods. They most frequently assessed the effectiveness of change management by visiting all departments involved, and reviewing all documents and interviewing users. Establishing a committee was the prime method driving multiple assessment of change management.

The directors felt supported regarding change in the academic library setting. However, funding didn't receive quite the same support. Directors spent most of their time and efforts in analyzing and introducing the library's need for change. Change is constant in library resources and services, as indicated by the fact that half of the

respondents noted that much of their time and effort was spent on managing change in resources, services, and administration. The directors experienced the largest areas of change in development of staff's new skills, upgrading technologies and facilities, budget adjustments, and policies. The majority of directors felt that change applied to various aspects of their libraries, and agreed that changes could occur in information technology.

The results summarized in Table 7.1 below answer the first research question of this study. In terms of how to actually manage change, directors utilized various approaches to managing change. Most directors employed multiple approaches. The structural and human resource approaches were the most frequently used single approaches, although dual approaches were also common.

A regression analysis confirms that demographics, human capital data, and library variables play significant roles in predicting directors' approaches used, as summarized in Table 7.2. Among the examined factors, library type is the most common determinant of directors' approaches used to manage eight specific areas of change. The second most common determinant is total years of library service influencing directors' approaches used to manage six specific areas of change. The other very common factors are gender, age, total years of present position, and number of different positions. More factors play significant roles in resolving conflict, planning change, and setting goals for change.

Most directors used multiple approaches to manage change. The results of both quantitative and qualitative data analyses show that age plays a significant difference in the approaches used. The quantitative data analysis confirmed that older directors were

more likely than younger ones to use multiple approaches to manage change. Older directors were also less likely to use dual approaches and more likely to use the human resource approach to resolve conflict. The collected qualitative data analysis demonstrated that the older directors were more likely than the younger ones to use the structural approach to manage change.

Table 7.1: Summary of Directors' Approaches Used to Manage Change

Survey Questions	Approaches Used; No. of Responses (%)		
	Single Approaches	Dual Approaches	Multiple Approaches
Question 9 (N=455) Managing Change in Information Technology	77 (16.9)	178 (39.1)	200 (44.0)
Questions 10 (N=455) Planning Change	58 (12.7)	136 (29.9)	261 (57.4)
Question 11 (N=455) Setting Goals for Change	26 (5.7)	19 (4.2)	410 (90.1)
Question 12 (N=455) Resolving Conflict	100 (22.0)	249 (54.7)	106 (23.3)
Question 13 (N=455) Communicating with the Public and Staff	49 (10.8)	48 (10.5)	358 (78.7)
Question 14 (N=455) Managing Change	41 (9.0)	69 (15.2)	345 (75.8)
Question 15 (N=455) Conducting Meetings	82 (18.0)	135 (29.7)	238 (52.3)
Question 16 (N=455) Making Change Decisions	37 (8.1)	188 (41.3)	230 (50.5)
Question 17 (N=455) Evaluating Change	166 (36.5)	188 (41.3)	101 (22.2)
Question 18 (N=181) Free Comments on Managing Change	91 (50.3)	51 (28.2)	39 (21.5)

Legend: No. = Number

Table 7.2: Regression Results of the Factors Influencing Approaches to Managing Change

Factors	Results of the Factors that Influence Approaches to Managing Specific Areas of Change (N = 455, except where noted)									
	1	2	3	4	5	6	7	8	9	10
Demographics										
Gender		X^a	X^b	X^a		X^a			X^a	
Age	X^b			X^b	X^d	X^b				X^b
Human capital										
Education Level		X^c		X^b						
Total Years at Present Position		X^a	X^a	X^b			X^b	X^c		
Total Years of Directorship			X^b					X^c		
Total Years of Library Service	X^c		X^b	X^a			X^b		X^a	X^b
No. of Different Positions		X^b		X^b			X^c		X^b	X^b
No. of Subordinates	X^c	X^b					X^a	X^b		
Library variables										
No. of Library Branches	X^a		X^b					X^b		
Library Type		X^c	X^b	X^b	X^a	X^d	X^a		X^a	X^b
Library Size					X^a	X^a			X^b	X^b

Notes: 1=Managing Change in Information Technology, 2=Planning Change, 3=Setting Goals for Change, 4=Resolving Conflict, 5=Communicating with Public & Staff, 6=Managing Change, 7=Conducting Meetings, 8=Making Change Decisions, 9=Evaluating Change, 10=Free Comments on Managing Change (N=181)
X^a = *$p < 0.10$; X^b = **$p < 0.50$; X^c = ***$p \leq 0.01$; and X^d = ****$p \leq 0.001$

The results of both quantitative and qualitative data analyses also display the statistically significant finding that directors' human capital features influenced their approaches used. The quantitative data analysis confirmed that directors with higher education would be more likely to use the structural approach to plan change and more likely to use other approaches to resolve conflict than those with less education. Directors who oversaw more subordinates were more likely to use multiple approaches to manage change in information technology and to make change decisions than those who oversaw fewer subordinates. Directors who served in libraries for longer periods of time were

more likely to use multiple approaches to manage change in information technology than their counterparts. However, in setting goals for change, they would be more likely to use dual approaches.

Directors who held more different professional positions were more likely to use multiple approaches to plan change and to use the symbolic and multiple approaches to conduct meetings than those with fewer different positions. Directors who had been in directorship for longer periods of time would be more likely to use the multi-frame approach to set goals for change. The approaches used by directors who had been in their current positions were significantly different from those used by their counterparts. The collected qualitative data analysis indicated that directors who had more years of library service were more likely to use the multi-frame approach to manage change than their counterparts.

Directors who worked for a higher academic degree college or university were more likely than their counterparts to use multiple approaches to manage change, to plan change, and to resolve conflict. Directors who worked in a college or university with higher enrollment were more likely than their counterparts to use the multi-frame approach to evaluate change. According to the collected qualitative data analysis, directors who worked at research libraries were less likely to use dual approaches to manage change in terms of the use of human resource versus dual approaches.

The results of regression analyses support many hypotheses of this study, as summarized in Table 7.3 below. However, the regression results do not support the

hypotheses concerning education level, total years at present position, and number of library branches in this study.

Table 7.3: Summary of Regression Results Supporting the Hypotheses of the Study

Hypotheses	Results Supporting the Hypotheses Concerning Directors' Approaches to Managing Specific Areas of Change (N = 455, except where noted)									
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
H1			X^b							
H2						X^b				X^b
H3										
H4										
H5			X^b							
H6	X^c						X^b			
H7		X^b					X^b			
H8	X^c						X^a	X^b		
H9										
H10		X^c		X^b		X^d				
H11									X^a	

Notes: **1**=Managing Change in Information Technology, **2**=Planning Change, **3**=Setting Goals for Change, **4**=Resolving Conflict, **5**=Communicating with Public & Staff, **6**=Managing Change, **7**=Conducting Meetings, **8**=Making Change Decisions, **9**=Evaluating Change, **10**=Free Comments on Managing Change (N=181)

H1=Females Are More Likely Than Males to Use Multiple Approaches to Manage Change; **H2**=Older Directors Are More Likely to Use Multiple Approaches to Manage Change Than Younger Ones; **H3**=Directors with a Higher Level of Education Are More Likely to Use Multiple Approaches to Manage Change Than Their Counterparts; **H4**=Directors Who Have Been in Their Current Positions for Longer Periods of Time Are More Likely to Use Multiple Approaches to Manage Change Than Their Counterparts; **H5**=Directors Who Have Been in Directorship for Longer Periods of Time Are More Likely to Use Multiple Approaches to Manage Change Than Their Counterparts; **H6**=Directors Who Have Been in Library Service for Longer Periods of Time Are More Likely to Use Multiple Approaches to Manage Change Than Their Counterparts; **H7**=Directors Who Have Held More Different Positions Are More Likely to Use Multiple Approaches to Manage Change Than Their Counterparts; **H8**=Directors Who Oversee More Subordinates Are More Likely to Use Multiple Approaches to Manage Change Than Their Counterparts; **H9**=Directors Who Oversee More Locations Are More Likely to Use Multiple Approaches to Manage Change Than Their Counterparts; **H10**=Directors Who Work for an Institution Offering a Higher Academic Degree Are More Likely to Use Multiple Approaches to Manage Change Than Their Counterparts; **H11**=Directors with More Enrollments Are More Likely to Use Multiple Approaches to Manage Change Than Their Counterparts.

X^a = *p< 0.10; X^b = **p< 0.50; X^c = ***p ≤ 0.01; and X^d = ****p ≤ 0.001

Directors used "other" approaches rather than Bolman and Deal's approaches to manage change. Directors used three types of "other" approaches: (1) in-source approach; (2) out-source approach; and (3) ex-source approach. Some directors brought in or hired consultants, or facilitators, to manage change. Others outsourced technology work, or functions. Another ones took staff to other libraries, and brought back knowledge, skills, or perceptions.

In a word, this study has confirmed that change is generally managed in academic libraries from structural, human resource, political, symbolic, dual, or multiple perspectives. Most directors used multiple and dual approaches. A correlation and regression analysis confirmed that demographics, human capital, and library variables play significant roles in managing change. Regression results show that older directors were more likely to use multiple approaches during change management. Directors who oversaw more subordinates were more likely to use multiple approaches to manage change in information technology, and to make change decisions than their counterparts. Those who worked for an institution offering a higher academic degree were more likely than their counterparts to use multiple approaches to plan change, and to resolve conflicts during the change process.

The results allow a better understanding of directors' attitudes, behaviors, and approaches to managing change in academic libraries. Directors may use the results to reflect on different options of management strategy and balance the weight of these

influences. Librarians may better understand different management techniques and approaches. Hopefully, this study will stimulate more research on the subject.

Integrating Approaches for Change Management Practices

In practice, it is common to use more than one approach to manage change because the "messy, turbulent world rarely presents us with well-defined, single-frame problems." (Bolman and Deal 2003, 301) People initially choose the frame(s) they have used in the past; this response is comfortable and time tested. They may become stuck in familiarity, and without apparent reason, they may actually dislike other approaches. But if coworkers choose other frames, which is highly likely, disagreement and conflict may result.

Academic libraries face multiple and evolving change, and every event is open to new interpretations. Before reframing can occur, directors must first honestly look at the approaches being used and those being ignored. The next step is to critically evaluate success of the current approach(es). Bolman and Deal (1984, 245-2460) term this action breaking out of our "psychic prisons." Critical self-assessment and reframing will allow new questions to arise and new options for action.

To manage any large-scale change in resources or services, directors and librarians need automatically reframe their approaches to the given time and situations. During the course of change, approaches may need to be reframed several times to meet evolving needs. How to choose appropriate approaches and use various approaches may be taught in schools as well as in work places. Schools of library and information studies

may offer the course related to director approaches used to better prepare students as change leaders in the future, while libraries or professional associations of library and information sciences may provide related training programs and workshops for directors and librarians to make them learn more. According to Bolman and Deal (2003, 309), choosing a frame or understanding coworkers' perspectives requires intuition, analysis, and artistry.

Reframing can clarify a situation, generate options, and evaluate strategies in addition to better understanding the multiple realities of coworkers. When someone's behavior is puzzling, most likely they see the world through different lenses. Using the reframing approach, directors, managers, librarians, or new librarians can learn and integrate different approaches to managing change and better understanding each other. "The turbulent managerial world of the next few decades will belong to the managers and the organizations with a more comprehensive understanding of the phenomena of each of the four frames." (Bolman and Deal 1984, 278-279).

Benefits to Directors

The results will allow a better understanding of directors' attitudes, behaviors, and approaches to managing change in academic libraries. Directors may use these results to reflect on different options of management strategy and to balance the weight of these influences. Questions to consider include:

1. What approaches would I consider if large-scale change projects would be performed?
2. What demographic and human capital characteristics do I have?

3. What library characteristics are there in our library?

4. Based on a comprehensive analysis of the current, what approach(es) is most appropriate to use?

While managing change, directors need to have a good understanding of their own demographic and human capital characteristics. In general, this will give them a better idea of what approaches they'd be more apt to gravitate to in a given situation. Reviewing the characteristics of the situation and their favored approaches will help the directors adjust managerial behaviors to meet the needs of the situation.

To balance the weight of human capital, directors need to analyze their own education level, total years at present position, total years of directorship, total years of library service, number of different professional positions, and number of subordinates.

The findings of this study will help directors analyze what library characteristics there are in their libraries, reflect on different options of management approaches, and balance the weight of library factors that significantly influence the approaches used, as shown by both quantitative and qualitative data analyses.

The finding of this study is that library variables played an important role in the approaches used. While reflecting on the approaches used, directors would clearly understand their own library features and consider the most appropriate approaches. Directors need to look at a specific change issue or problem using each of the confirmed approaches, reframe one more time, and finally determine which approach is the most appropriate.

Benefits to Librarians

If librarians are provided with the directors' approaches used to manage change, and students of library and information science are educated in these approaches and how to appropriately use them, they will have a better understanding of change management. This knowledge will enable them to understand different management techniques and enhance their communication skills by developing empathy for viewpoints of their coworkers.

The classes may be given in graduate school. Directors may have workshops on this for librarians.

Before Bolman and Deal's research, little was known about management styles and the factors that contributed to them. More research is needed on this evolving topic to ensure that skills remain current in an evolving climate.

How Academic Libraries Can Help Directors

Information technology affects all areas of academic libraries, creating unstable environments. Evolving information technology is the driving force behind change in libraries and leads to corresponding changes in resources, services, and administration. Libraries need to train their personnel on how to manage change using appropriate approaches. The management approaches chosen depend on the situation. As the situation evolves, so should the approaches used.

Implications

This exploratory study contributes to the body of knowledge in the management of change in the academic library and the professional management and leadership literature by examining how directors actually manage change and the factors influencing the management approaches used. The detailed findings discussed in Chapters V and VI address the varied approaches utilized to manage change and the significant factors affecting the use of those approaches.

Using the findings of this study, we can now explain some management behaviors and how they affect the academic library setting. This study has illustrated that frame-related issues in academic libraries and director managerial actions coincided with and confirmed the Bolman and Deal model. This model has not been explored and applied using such a comprehensive empirical study before within the academic library setting. This study has also demonstrated that directors actually used multiple approaches as well as single and dual approaches to manage change, and provided examples of how directors' demographics, human capital, and library characteristics relate to the use of structural, human resource, political, symbolic, dual, and multiple approaches. Directors, managers, and librarians can benefit from knowing how demographics, human capital, and library characteristics influenced directors' approaches used. For example, directors might reflect on how they generally manage change through communicating and realigning formal roles and relationships, providing training and support for people,

dealing with conflict, and creating rituals as respectively seen in the structural, human resource, political and symbolic approaches.

One of the management behaviors that we did not understand before is the dual and multiple approach usage. Most directors used the dual and multi-frame approach to manage change in information technology, plan change, set goals for change, resolve conflict, communicate with the public and staff, conduct meetings, make change decisions, and evaluate change during the change process. They also used the dual and multiple approaches to manage change in library funding, library personnel, and public relations. The multi-frame approach may be the most beneficial when dealing with the changing issues in academic libraries. It may well take into consideration all issues faced by a director when managing change in current library complex situations.

The next management behavior is the use of the structural and human resource approach, which were used more often as part of dual or multiple approaches. Most likely, these approaches were chosen because directors spend much of their time working with a variety of people and realigning roles and duties of staff in current academic libraries, which are caught up in the mode of rapidly changing technology.

In this study, the human resource approach was the most frequent single approach used except for conducting meetings during the change process. This also reflects that the change issues related to people dominate in academic libraries. People may support or resist change. As Bolman and Deal (1997, 15) stated, "From a human resource perspective, the key to effectiveness is to tailor organizations to people – to find an

organizational form that enables people to get the job done while feeling good about what they are doing."

The consequence of the multi-frame approach to management can be explained in a new way. The multi-frame approach may be the most beneficial approach because most directors used it in this study. This approach would help directors take correct managerial actions during the change process and manage change much better.

Directors who were older, had been in directorship for longer periods of time, oversaw more subordinates, or worked for an institution offering a higher academic degree used the multi-frame approach to manage change more often than their counterparts. This was consistent with the hypothesis and confirms that directors who had more experience managing change and thinking about the many issues related to change, experienced more alignment of roles and responsibilities and interpersonal interactions, or managed more changes are more apt to use the multi-frame approach. To manage change better, they might need to pay more attention to reallocation of existing personnel, improve coordination, change job descriptions to support library needs or initiatives, and support subordinates' professional development and training.

The finding that directors who worked for a higher academic degree college or university, served in libraries for longer periods of time, or held more professional positions were more likely to use the multi-frame approach is consistent with the hypotheses. This also confirms that these directors experienced more library-wide reorganizations, built on rich past experiences, and may have dealt with and thought

about many issues, including "structure, needs, conflict, and loss" (Bolman andDeal 2003), when managing change. It also implies that they experienced more changes and used the integrative and holistic approaches to manage change. They took into account all the elements for change projects.

The results of this study have demonstrated that females were more likely than males to use multiple approaches to set goals for change, while males were more likely than females to use multiple approaches to evaluate change. The significant findings of gender are not consistent with what Bolman and Deal discovered. According to Bolman and Deal (1991b, 529), there is no significant relationship between gender and directors' approaches "in relation to frame orientations and effectiveness." This implies that the significant findings relating to the relationships of variables were only generalized within this cross-sectional study. Future studies using different research methods and respondents may have different findings and interpretations.

The findings of this study has provided some significant information on what kinds of directors to hire. When recruiting library directors, the hiring managers might consider and analyze applicants' library features as well as demographic and human capital characteristics in terms of the findings of this study. If a hiring manager of a higher academic degree college or university would hire a library director, he or she would consider and hire an applicant who once worked in a higher academic degree college or university, served in libraries for longer period of time, oversaw more subordinates, and held more professional positions in addition to meeting the position's

qualifications and requirements. These applicants would be considered and hired because they might have experienced more changes in resources and services, would manage change in academic libraries better, and would meet the increasing demands of students, faculty, and staff in changing library environments.

In this study, directors used true "other" approaches rather than Bolman and Deal's approaches to manage change. As Bolman and Deal (2003, 9) stated, "When managers cannot solve problems, they hire consultants." Bolman and Deal explicated what leaders and managers would usually do while finding something wrong. Leaders and managers would do three things: they would go to the government for help; they would go to consultants; and they would blame the bureaucracy (Bolman and Deal 2003). According to Bolman and Deal, it might not be correct for leaders and mangers to go to these three things before they reframe because these strategies are short-term. This study found that directors used the in-source approach a lot of times; that is, they hired consultants to come in before reframing change. The implication is that this study indirectly reflects the necessity for directors to reflect their choices of approaches to change management, balance the weight for these influences, and improve their reframing skills in order to manage change much better in the future. This study also found that directors used the out-source approach, that is, they outsourced technology. This implies that it is very important for academic libraries to enhance librarians and staff's technology training and for programs of library and information sciences to strengthen students' technology education.

While managing change in information technology, directors used approaches different from those of Bolman and Deal including outsourcing and "other" in-source approaches. The outsourcing approach involved technology work and items such as webpage design and maintenance. This suggests that in the schools of library and information sciences, more education of information technology should be provided for graduate students of library and information science. The graduate students' mastery of information technology should be strengthened. Directors also utilized consultants to manage change. That is, they used the in-sourcing approach to manage change in information technology. They should attend more professional workshops and improve their own knowledge and skills of change management. Only when they are able to manage change by themselves can they manage change much better.

Based on the significant findings of this study, there are some important practical actions to be considered by educators of library and information sciences as well as library practitioners. These actions include but are not limited to the following: (1) The multi-frame approach should be taught in schools as well as in work places because directors "need to understand that any event or process can serve multiple purposes and that different participants are often operating in different frames" and should integrate the change perspectives for effective management (Bolman and Deal 1991, 341); (2) Schools might offer the course entitled Managing Change in Libraries and Information Centers to better prepare new librarians as effective change leaders in the future; and (3) Libraries or associations of library and information sciences offer seminars, presentation programs, or

workshops on the management of change in the information age to share the results of this study with library directors, faculty, and students and make them reflect on different options of management approaches, better understand various management techniques and approaches, and adjust their managerial actions when managing change.

Future Research

Currently, there is an increasing need for academic libraries to plan and implement changes in response to external and internal pressures. However, managing change in the academic library setting is open to some failures. Academic library directors are change leaders and play a key role in effectively managing change in academic libraries because change can be led, and leadership does make a difference (Fullan 2001, 34). The roles of academic library managers, librarians, and staff as change agents are the key to effective change management. This study confirmed that some directors managed change from a structural perspective, while others managed change from multi-frame perspectives. So, what are the reasons for the failures and what perspective leads to effectiveness? The future research should focus on determining the most effective approach in managing change in today's academic library environment and the academic library director or manager attributes, leadership behaviors, or management styles that are associated with effective change management.

The change management process is dynamic, nonlinear, and complex. Effective change management in academic libraries is difficult to quantify. There is a need to examine change reality in academic libraries to determine whether management of

change is effective in resources, services, and management. Therefore, future research methods appropriate to investigate this topic would include quantitative research methods such as evaluation research and qualitative research methods such as in-depth interview, case study, and the historical and comparative method.

Evaluation Research

Future research involves the effectiveness of change management in academic libraries. Evaluation research is appropriate for examining this topic because it determines whether a change in resources, services, or management has attained the identified goals and objectives. As Wallace and Van Fleet (2001, xxi) stated, "Evaluation leads to enhanced efficiency and avoidance of errors." However, evaluation research is not considered a method of data collection or a unique component of research designs (Schutt 2004, 311). It is the application of many research methods.

The need for the future research is to evaluate the effectiveness of change management and the impact of the implemented changes on resources, services, and management in academic libraries. The selection of a research design and specific method of data collection depends on the focus of the project and its research questions. If evaluation researchers focus on the evaluation of the change management process in academic libraries, they can appropriately use the process evaluation method. If researchers focus on outcomes of change projects, they utilize the outcome assessment method, which helps to determine whether change efforts have produced the intended results. Researchers can discover outcomes from change project documents, change

plans, and reports. Quantitative evaluation research focuses on the extent to which change management in academic libraries has resulted in the identified change goals and objectives.

Evaluation research has its own relative strengths and weaknesses. It is comprehensive in examining effectiveness, since researchers integrate the steps of change into the entire process to determine some intended and unintended results from change inputs to outcomes. It provides evaluation researchers with sufficient feedback in the evaluation process. It tests change project impacts. It offers researchers rare opportunities to investigate the complex change process in academic libraries and make high quality analyses of effective change management. But, evaluation researchers have to think about and resolve some important issues such as: the scale and scope of evaluation; the type of change activities, efforts, or perspectives that should be included or excluded; and whether evaluation should look at change outcomes in the short term, intermediate term, or in the long term. Evaluation researchers may miss some important outcomes or aspect of management of change in academic libraries.

Researchers may employ triangulation, which includes qualitative and quantitative research methods of observations, interviews and surveys to collect data on the effectiveness of change management, if time and finance permit. The questions in the interviews and questionnaires center on: assessing each step of change management process, reviewing and assessing perspectives and factors that are most effective to implement change, and determining how effective change management attains the

identified goals and objectives. Researchers may also ask participants to fill out designed evaluation forms of effective change management in academic libraries.

The qualitative data from observations and interviews can be analyzed at the beginning. When researchers need to obtain more information in the studies, they redesign and revise the questionnaires. They identify the meanings, relationships, and themes of this topic through qualitative data analysis. They find the most effective model, approach, strategy, technique, and perspective on change management through the analyses of quantitative data by percentages, correlations, and regressions.

In-depth Interview

Future research is needed to describe and understand the meaning and experiences of the effectiveness of change management in academic libraries. In-depth interview, one of the qualitative research methods, is appropriate for investigating this topic. Interview research assumes that people have rich experiences in this topic and can provide interesting data, thereby providing a valuable source of information. Therefore, this method permits researchers to comprehensively and deeply learn how to manage change effectively, examine the change process over time, and study people's attitudes and behaviors. Using this method, researchers can discover how people think or feel with regard to this topic. They can ask people how change was managed effectively in the past and how to manage change more effectively in the future. Researchers can also obtain a range of perspectives from academic library directors, managers, librarians, and staff concerning the same change event in resources, services, or management.

In-depth interviews provide both strengths and weaknesses. First, researchers can obtain a deeper and fuller understanding of the effective management of a change event or phenomena that the researcher cannot directly observe in academic libraries. The validity of this method may be greater than that of surveys. In addition, this method has a high response rate, offers flexibility, and enables complete and complex questions. Researchers can control question order, environment, anonymity, and standardized wording. But the reliability of this method may be problematic. In-depth interview measurements are very personal and therefore problematic (time- and cost-wise) when trying to reach a larger population. Conducting in-depth interviews can be expensive and requires lots of recording, transcribing, and coding time.

Data for the qualitative study might be collected through interviewing subjects related to this topic. The investigator introduces him/herself, gives the interviewee the contact information, and identifies him/herself, before turning on the tape. The interviewee is identified and agrees to participate in the interview. The interviews are recorded, but the tape is not turned on until the consent form is explained and signed. The interviewee is asked to fill out the basic demographic and human capital questionnaire. A list of interview questions might be redesigned. The interviewee appears comfortable about responding to questions.

After data collection, data is processed and entered into a computer program. However, coded data is not quantified. The original information, without grammatical error, will be kept as much as possible. According to Babbie (2006, 378), "data

collection, analysis, and theory are more intimately intertwined" in a qualitative study. In research on effective change management in academic libraries, researchers may identify concepts and themes during data processing and codification as data is continually coded. The code notes are kept for further analysis as the study progresses.

In the qualitative study of this topic, statistical techniques may be used to analyze the collected data. Qualitative data analysis mainly lies in looking for patterns and themes. During analysis, the investigators read; ponder the sets of collected data; and look for meaning in concepts, themes, and the relationships between those concepts and themes. In the qualitative studies, the researchers can change the instrument or instrument questions to get a richer meaning. For instance, if researchers find some new concepts and approaches regarding the effectiveness of change management in academic libraries, they can change the basic interview questions to explore the studies more. It is possible to change the instrument because the generalization of the analyzed results is not the assumption in qualitative studies.

The collected data are coded and analyzed in terms of themes. Researchers may use a video camera while interviewing. As they code, transcribe, and organize the data during data processing, a transcript might be sent to an interviewee to check for reliability. Reliability might also be tested by asking the same interview subject the same questions, but with a different wording. Because different researchers may get different interpretations from the same data, they may also ask colleagues to code the same data to

see if their results are the same, to check whether the collected data are valid, and to validate whether the questions are relevant to the studies.

Case Study

As Bromley (1986, 23) stated, "Case-studies, by definition, get as close to the subject of interest as they possibly can, partly by means of direct observation in natural settings, partly by their access to subjective factors (thoughts, feelings, and desires)." Effectively managing change in academic libraries involves particular problems, contexts, and issues in the specific steps of change process. Case studies are concerned with factual information as well as opinions. Therefore, case studies are appropriate for investigating this topic because researchers can deeply study various factors that have an impact on the effective management of change in academic libraries, understand steps or phases in change processes, and look into a change phenomenon within external and internal academic library environments. From a constructivist point of view, the assumption is that there is no objective change reality that is stable and fully known. Researchers may focus on the attainment of basic meanings and qualities of this topic.

Case studies have their own strengths and weaknesses in investigating this topic. They permit an examination of real change contexts and different dynamic issues on this topic, and an in-depth research on this topic in natural settings of academic libraries. They regard respondents as experts of effective change management, and concentrate on their experiences. They use many resources of evidence and multiple methods. But, findings that include subjective information and biases because of the presence of

researchers lack validity and reliability. Case studies lack objectivity, replication, and enough evidence supporting causality.

There is no agreed classification for the types of case studies. Case studies can be divided into three types: intrinsic, instrumental, and collective (Stake 1995). But, in the studies of information professionals, the five case studies that are most likely to be used by researchers are "observational case studies, interview case studies, organizational case studies, life history case studies, and multi-site and comparative case studies" (Gorman and Clayton 1997, 49).

At the beginning of the studies, researchers might conduct an organizational case study that "focuses on a specific information agency, tracing its development over time. . . and how the organization came into being, including treatment of its antecedents. . ., changes and developments over time, its current situation, and perhaps even future projections" (Gorman and Clayton 1997, 53) to make sure that there are enough historical data for organizational case studies available on the effectiveness of change management in an academic library. The research questions can refer to how change is effectively managed in an academic library; what models, approaches, techniques, and perspectives in managing change are more effective; and which aspects are effective and ineffective in managing change in academic libraries. In the studies, researchers can employ the triangulation that includes observation, interviews, and email exchanges, if the historical data are not sufficient for exploring the research questions.

In collecting data from the organizational case studies on effective change management in academic libraries, researchers depend on a range of data sources, including written records: annual reports, meeting minutes, policy statements, and personnel records (Gorman and Clayton 1997, 53); interviews with academic library directors, librarians, and staff; and the observations of the on-site operations of academic libraries.

The organizational case studies concentrate on four types of academic libraries: research libraries, teaching libraries, community libraries, and specialized college libraries. The purposeful sampling is used in the studies because it offers what is needed in a case study of an organization, community, or some other clearly defined and relatively limited group (Schutt 2004, 151). In order to strengthen the integrity of the study and obtain a variation of perspectives in effectively managing change in academic libraries, researchers take a holistic approach by mixing the subject age, gender, length of service, education, experience, and type of academic library. In the interviews, the researchers may collect data concerning the subject's experience of effectively managing change in academic libraries. All such interviews should be recorded.

Qualitative research may be combined with quantitative measures of populations in case studies (Silverman 2005, 128). Silverman (2005, 128) stated that "Quantitative measures may sometimes be used to infer from one case to a larger population." As for the data collected from interviews using a tape recorder, researchers often transcribe the tape recordings. After reviewing full transcripts and field notes from observations,

researchers begin to discover patterns and connections through content analysis in accounts of the effectiveness of change management in academic libraries. Data analysis is a continuous process in the case studies. As Gorman and Clayton (1997, 251) stated, "data analysis was a non-linear process of seeing a pattern, returning to the data or the study site and confirming the pattern or an observation with an informant." Researchers conduct a formal data analysis to review all collected data at least three times, assign categories to the reviewed data, and cope with the complex data by means of "charts, graphs, and other illustrations requiring creative, interpretive skills to draw out the full meaning of relationships between units and integrate those interpretations into a meaningful account" (Gorman and Clayton 1997, 199).

A single case analysis can be generalized through three methods: "obtaining information about relevant aspects of the population of cases and comparing the single case to those; using survey research on a random sample of cases; and coordinating several ethnographic studies" (Hammersley 1992). Researchers analyze qualitative data by "affixing codes to a set of field notes; noting reflections or other remarks in the margins of notes; sorting and sifting data to identify key events, phrases, relationships between variables, patterns, and themes; confirming patterns and themes through additional data collection and analysis; and developing new theories" (Gorman and Clayton 1997, 204).

Historical and Comparative Research Method

Undoubtedly, many change initiatives and projects have been completed and managed in academic libraries during recent years. The relevant documents kept in academic libraries indicate whether change was effectively completed in academic libraries, what led to change management efficacy, and what caused the failures. The historical and comparative method is appropriate for examining this topic because it focuses on data collection from past records (Schutt 2004, 338). This method permits researcher to discover patterns of effectively managing change in academic libraries.

The historical and comparative research method has its relative strengths and weaknesses. It allows researchers to accurately portray how academic library directors, librarians, and staffs manage change. Researchers can determine whether change management is effective; trace the change process in academic libraries over time; provide the first-hand information on change results; and compare management of change in resources, services, and management among various academic libraries. But, the records of change management in an academic library might be limited. Researchers sometimes have limited access to relevant documents on this topic. Findings can be biased because of the presence of researchers and data sources, and lack validity and reliability because some records are unofficial or secondary.

Future researchers collect data from written records such as change plans, change implementation reports, meeting minutes, change initiatives, change efforts, convincing

documents on change events in a specific academic library, and documents describing the interrelations among different events and processes (Schutt 2004, 340).

Researchers use the collected data to conduct an event-structure analysis, which is "a qualitative approach that relies on a systematic coding of key events or national characteristics to identify the underlying structure of action in a chronology of events" (Schutt 2004, 341). Researchers use coding and memo-writing techniques (Neuman and Kreuger 2003, 442) to analyze the collected data. They divide the collected data into several categories or events and use codes to "construct event sequences, to make comparisons between cases, and to develop an idiographic causal explanation for a key event" (Schutt 2004, 341). Using this method, researchers identify concepts, themes, patterns, and the similarities and differences about managing change in academic libraries, They also discover the most effective perspectives, models, approaches, strategies, and techniques for managing change.

The research on effective change management in academic libraries has not developed its own theory. According to Littlejohn's (2002) views, a theory is "a set of concepts." A theory's second element is "explanation." Traditionally, social scientists use the research methods on the basis of four approaches: (1) developing questions, (2) forming hypotheses, (3) testing hypotheses, and (4) formulating a theory (Littlejohn 2002). The empirical studies of effective change management in academic libraries rely heavily on the appropriate research methods used to answer research questions generated by theory or theories relating to change management or general management. Moreover,

most of management theories work for change management. It is fundamental to have a theoretical basis for change management to obtain the effectiveness through the careful diagnosis and identification of internal and external factors of situations of academic libraries.

In the selection of future research methodologies for investigating this topic, researchers should take into account many important factors such as the underlying theoretical paradigm and goals, the appropriateness of research methods for this topic, adequacy of the method for the research objects, the expected outcomes, and the strengths and weaknesses of each method. If they are interested in objectivity, relationships, causality, and precision in the research on this topic, they need to employ a quantitative methodology. If they want to approach dynamic and complex change reality in academic libraries to examine whether management of change is effective and capture the meanings and experiences of this topic, they should employ a qualitative methodology.

Quantitative and qualitative research methods are appropriate for investigating this topic, and have their relative strengths and weaknesses. Quantitative research methods study relationships between variables to examine the effectiveness of change management. They can generalize findings. Their strengths are objectivity, reliability, and replication. Quantitative research is mainly positivistic, and strives for the facts or causes of change phenomenon. Its purpose is to assess or evaluate this topic. It has

precise measurements and findings. In quantitative research, the researcher has a passive role.

The researcher, however, has an active role in qualitative research. Qualitative research is mainly phenomenological, and strives for understanding people's experiences with this topic. It produces descriptive data. The conclusions of qualitative studies result in grounded theories. But, the conclusions and findings of qualitative studies are not precise.

Taking into account the topic and its corresponding research questions generated by theories relating to change management and general management, the researchers may employ triangulation because it allows researchers to thoroughly examine all possible aspects of the topic from multiple perspectives and overcome the weaknesses of single-method studies. This makes the nature of research data and knowledge of this topic richer, and results in higher validity and reliability in the studies.

Concrete situations of the future research on this topic in terms of time, cost, and method demand concrete analyses. Researchers may have different research interests in this topic. They can use other methods to examine research questions. They can collect data from surveys, interviews, and case studies, and code and analyze the collected qualitative data in terms of concepts, patterns, and themes. They can also utilize the descriptive and inferential statistical techniques such as frequencies, percentages, correlations, and regressions to analyze the collected qualitative and quantitative data.

Findings in this study were summarized based on those results of significant

relationships between directors' approaches to managing change and demographics, human capital, and library variables using chi-square test, binary and multinomial logistic regressions at the .05, .01, and .001 levels. Those findings for significant relationships between directors' approaches used and three types of predictors at the .10 level in this study need to be further confirmed in the future research.

This is a cross-sectional study. A longitudinal study would be conducted to further examine how directors actually manage change, and what factors influence their management approaches. It would reveal the various significant factors and directors' approaches used over time.

In the survey questions of Curzon's (2005) two scenarios, only men's names were used. Further research will examine whether responses would have differed if women's names instead of men's names in these scenarios had been used.

This study examined the factors influencing academic library directors' approaches used by taking into account all the available three types of predictors. Future research will focus on which model is the best fitting one predicting directors' approaches used by controlling one type of the independent variables, and at the same time, add more predictors such as directors' attributes to further examine the significant factors predicting directors' approaches used. Directors' attributes include, but are not limited to, vision, integrity, honesty, creativity, and flexibility. These attributes would be added because they might play an important role in directors' approaches used. For instance, flexibility is one of directors' attributes. "Flexibility in thought encourages

flexibility in action, the ability to play a necessary role in a situation without sacrificing core values." (Bolman and Deal 1984, 299).

Some directors might think that flexibility is important for them to manage change more effectively, while others might take the opposite position. Directors' attributes might influence their approaches used. It is necessary to add them as predictors to further examine factors influencing directors' approaches used. As Bolman and Deal say (1984, 294),

> To us, the major difference between managers and leaders is how they view organizations. Managers tend to think rationally or humanistically-sometimes resorting to politics as a last resort. Leaders, on the other hand, are able to see all dimensions of social collectives-including oft-neglected political and symbolic levels of human behavior. They are leading managers, managerial leaders, something more in any event than custodians of the status quo. They are able to see things differently-to have visions of new strategies or patterns in everyday thought and deed. Their flexibility of thinking fosters flexibility in their behavior. They are able to act inconsistently when consistency fails to work, tenderly when emotions are raw, nonrationally when situations make no sense, politically when reason falls to parochial self-interest, playfully when goals and purposes seem counterproductive. These are the kind of people that will lead (manage) the organizations of tomorrow.

This research was limited to the population and sample for academic library

directors. The roles of academic library managers, librarians, and staff as change agents are the keys to change management. It is necessary that directors of school, public, and special libraries identify necessary changes and manage them effectively. Similar research could be expanded and conducted to target school, public, and special library directors as well as academic library managers and librarians. Results from these studies could provide a more comprehensive view of how to manage change at all types of libraries and information centers.

This study revealed that directors used various methods to assess the effectiveness of change management. Some directors visited all departments involved to assess the effectiveness of change management. Others reviewed all documents and interviewed users. Future research will examine the factors influencing the methods used by directors.

The directors' roles in managing change in this study varied. Directors spent most of their time and efforts in analyzing and introducing the library's need for change. They managed change in resources, services, and administration to various extents. Future research will examine the factors influencing directors' time and effort in managing change.

One of the findings indicates that directors' years of present position and directorship play a significant role in managing change. As Euster (1987, 80) found, "more change is made in the early years of a directorship." New directors may be brought

in for the purpose of making change. Further research will examine how directors make change in the early years of a directorship.

This study demonstrates the important finding that directors use in-, out-, and ex-source approaches during the change process. However, the limitation is that some respondents chose "other" approaches while managing change and did not give any comment. A large sample of future research will be conducted on the directors' use of these three approaches in addition to other approaches and the factors influencing their use of these source approaches while managing change.

Similar research should be conducted using other Carnegie types of schools such as associate colleges and special focus institutions to examine how directors actually manage change and what factors influence their approaches used. The results could be compared with those in this study to see the similarities and differences.

The current study depended on the directors' self report. Additional further study is needed to compare directors' self-perceptions of approaches to change management with academic library managers or librarians' perceptions of directors' approach use in order to examine the congruency among director, manager, and librarian perceptions of approaches to change management in the information age.

The finding that the majority of directors managed both planned and unplanned change, felt that change applied to various aspects of their libraries, and agreed that changes could occur in information technology implies that change is constant in academic libraries, and it is necessary to conduct more future research on how to manage

change in today's changing academic library internal and external environments, and provide valuable findings for directors while dealing with future change.

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APPENDIX A

Table 2.1: Reframing Change Model

Table 2.1. Reframing Change Model

Approach or Frame	Theoretical Sources & Focus of Each Approach	Barriers to Change	Basic Strategies
Structural	Mainly based on two theoretical sources: (1) the scientific management approach by Frederick W. Taylor (1911) and Henri Fayol (1919/1949) and (2) the bureaucratic model of Max Weber (1947), a German sociologist (Bolman and Deal 1983, 30-31). The adoption of views, concepts, assumptions, and ideas of rational systems theorists who focus on organizational goals, roles, and technology (Bolman and Deal 1984, 2); concerned with rules, procedures, process, and hierarchy (Bolman and Deal 2003), and the confirmation through the empirical study	Loss of clarity and stability, confusion, chaos (Bolman and Deal 1997, 321)	Communication, realignment, and renegotiation of formal patterns and policies (Bolman and Deal 1997, 321)
Human Resource	Adopted from several human resource theorists, Abraham Maslow's (1970) theory of human needs and motivation, Douglas McGregor's (1960) Theory X and Theory Y, and Chris Argyris' (1957, 1964) theory (Bolman and Deal 1984, 63-75). The adoption of views, concepts, assumptions, and ideas of human resource theorists who concentrate on the interdependence between people and organization (Bolman and Deal 1984, 2); focuses on meeting needs of people (Bolman and Deal 2003), and the confirmation through the empirical study	Anxiety, uncertainty, feelings of incompetence, neediness (Bolman and Deal 1997, 321)	Training to develop new skills, participation and involvement, and psychological support (Bolman and Deal 1997, 321)

Political	Theoretical sources from political science (Bolman and Deal 1991a) The adoption of views, concepts, assumptions, and ideas of political theorists who "see power, conflict, and the distribution of scarce resources as the central issues in organizations" (Bolman and Deal 1984, 2); concentrates on scarcity of resources, conflict, negotiation, and bargaining (Bolman and Deal 2003), and the confirmation through the empirical study	Disempowerment, conflict between winners and losers (Bolman and Deal 1997, 321)	Creation of arenas where issues can be renegotiated and new coalitions formed (Bolman and Deal 1997, 321)
Symbolic	Adopted from several theoretical sources, with main concepts from a variety of disciplines such as sociology, political science, psychology, and anthropology (Bolman and Deal 1984, 151) The adoption of views, concepts, assumptions, and ideas of symbolic theorists who emphasize problems of meaning in organizations (Bolman and Deal 1984, 2); focuses on culture including use of rituals, stories, ceremonies, and myths (Bolman and Deal 2003), and the confirmation through the empirical study	"Loss of meaning and purpose, clinging to the past" (Bolman and Deal 1997, 321)	"Creating transition rituals: mourning the past, celebrating the future" (Bolman and Deal 1997, 321)

Reference: Bolman and Deal (1984, 1991a, 1991b, 1997, 1999, 2003).

APPENDIX B

Table 2.2. Summary of Reviewed Elements Associated with Change Management and Demonstrations of Key Points from the Literature and Researcher's Viewpoints

Table 2. Summary of Reviewed Elements Associated with Change Management and Demonstrations of Key Points from the Literature and Researcher's Viewpoints

Elements/Key Points and Viewpoints	Key Points from the Literature	Researcher's Viewpoints
1. Definitions	a. There is no agreed-upon definition of change. b. Change management is defined from many perspectives as a service, activity, or set of techniques or procedures.	a. Large-scale change causes a transformation and enables library resources and services to continuously meet the demands of faculty, students, and staff via an extensive planned and complex process. Change includes, but is not limited to, information technology, resources, services, budgeting, tasks, policy, facility, or personnel. b. Change management refers to process: identify new needs for change, plan change, evaluate proposed change before it is accepted to reduce risk and cost, implement change, and evaluate change results.
2. Types of Change	Five different types of change, with different expressions and interpretations: (1) continuous and discontinuous; (2) planned and unplanned; (3) first and second order (Mink 1993); (4) developmental, transitional, and transformational (Ackerman Anderson 1986); and (5) structural, cost-cutting, process, and cultural (Luecke 2003, 8-9)	Correctly understand and differentiate types of change to help build strategies for managing change; different types of change require different approaches.
3. Management of Technological Change	Four main categories of literature on technological change: (1) opinions on information technology, (2) rapidity of changes and symptomatic techno-stress, (3) empirical study, and (4) study of how technological changes are managed	There is a void in the literature regarding what factors influence academic library directors' approaches to managing change in information technology.

4. Managing Change in Academic Library Functions and Other Areas	Most related literature on concrete academic library functions, "desired organizational responses to certain environmental stimuli," and "changes in library acquisitions, information services, and technology deployment to meet narrowly defined change imperatives" (Stephens and Russell 2004)	a. Literature on acquisitions on selection and ordering processes in academic libraries and how to manage change (Diedrichs 1996; Hollis 1998; Siddiqui 2003) b. Studies of how to manage change in a library service, technical services processes, restructuring of traditional interlibrary loan department, and reference services indicate some of the features (Gilles and Zlatos 1999; Odini 1990; Zuidema 1999) c. Related literature is on exploring changing roles of professional and paraprofessional staff in libraries (Johnson 1996; Simmons-Welburn 2000; Wilson 2003; Auster and Taylor 2004)
5. Managing Change through Structural, Human Resource, Political, Symbolic or Multiple Approaches	The changes in academic libraries parallel change developments and trends in other organizations such as reorganization of work, restructuring, and cultural changes (Travica 1999, 174). Changes in information technologies have brought great changes to all aspects of management in academic libraries for the past two decades. Traditional academic library structures for resources, services, and administration might not adapt well to the changing internal and external environments. They need to be reframed to keep pace with requirements to provide better resources and services for patrons. Some studies show that changes in resources, services, and	a. The main areas of managing change from a structural perspective involve entire library systems, technical services divisions, and functional organizational structures for academic libraries. Some empirical literature has produced results by analyzing how to manage change from a structural perspective, but it can be criticized for some weaknesses. b. People are one of the most important variables that should be taken into account in the management of change. c. The theme of managing change from a symbolic perspective is explored to a much lesser degree in academic library literature, but to a wide degree in the literature of other fields. Most of the literature on cultural change is in the form of

	administration are managed through structural, human resource, political, symbolic or multiple approaches.	conceptual papers. Fewer empirical studies are specifically on the management of cultural or symbolic change in academic libraries. d. There are multiple realities in all organizations, and each change may be viewed and managed through many approaches. There is no exception for academic libraries. Few empirical studies reveal that change is managed through multiple approaches in the changing technological environments.
6. Summary	This review of relevant literature mainly deals with research studies related to the key elements of definitions, types of change, reframing change model, management of technological change, and approaches to the management of changes in academic libraries. Most of the reviewed literature addresses the topic of technological change, and management of change in academic library functions. Although some literature addresses the management of change from structural, human resource, political, cultural or symbolic, or multiple perspectives, empirical studies are lacking. Most reviewed empirical research focuses on practice. The frequently used research methods of this topic are survey research and case studies. Most empirical studies in this review are cross-sectional. The gap in the literature is that no research is conducted on what factors influence academic library director's approaches to managing changes. It is important to study this issue because the findings of this kind of research will be helpful to understand directors' attitudes, behaviors, and approaches to managing change in different types of academic libraries. This kind of study will reveal whether some approaches to change management are more common than others and whether there is some consistency in change management among library directors. The results of this kind of research will allow directors to reflect on their different options, balance the weight of these influences, and better understand which factors are most significant in explaining their approaches.	
7. Future Research	There is a need for research on approaches of academic library directors in managing change; and directors' demographic and human capital that are most likely to have significant impact on their choices of managing change through a structural, human resource, political, symbolic, or multi-frame approach.	

APPENDIX C

E-mail Cover Letter

E-mail Cover Letter

Dear Dr., Mr. or Ms. .....:

I am a doctoral candidate in the School of Library and Information Studies at Texas Woman's University (TWU).

I am currently working on my dissertation tentatively entitled *The Management of Change in the Information Age: Approaches of Academic Library Directors in the United States.* This research project has been reviewed and approved by the Institutional Review Board (IRB) and the Graduate School of TWU. The purpose of this study is to examine how academic library directors in the United States actually manage change, and what factors influence their approaches to change management. In this study, change refers to large-scale one that causes a transformation and enables library resources and services to continuously meet the demands of faculty, students, and staff via an extensive planned and complex process. Change includes, but is not limited to, information technology, resources, services, budgeting, tasks, policy, facility, or personnel. Change management is the process of identifying the needs for change, planning and implementing the change, and evaluating the change both before it is accepted and after the project is finished. The findings of this study will help understand library directors' attitudes, behaviors, and approaches to managing change in different types of academic libraries, and will provide useful information for the directors to plan, implement, and manage change in the future. You are cordially invited to participate in this study.

This online survey takes approximately 15-20 minutes to complete. Please click on the following link to access the online survey at https://www.surveymonkey.com/s.aspx?sm=W4_7Ud2TVhD0pPJyWuqPJg_3d_3d, and follow the instructions on the questionnaire. Your views and responses would be most greatly appreciated and valued. A brief report of the major research findings will be provided for you at the end of this study if you check "Yes" for the last question of this survey.

There is no risk at all to take part in this study. Your participation is voluntary. You may withdraw at any time without penalty. All your responses to the questionnaire will be kept absolutely confidential. All the returned questionnaires will be destroyed after the completion of my dissertation study. The return of your completed questionnaire constitutes your informed consent to act as a participant in this study.

Please complete this online survey by ..... If you have any questions, please don't hesitate to contact me. You may also contact the TWU IRB at IRB@mail.twu.edu or 940-

898-3378 with any questions regarding your rights as a research subject. You may keep this notice for your record.

Thank you very much in advance for taking your precious time to participate in this study. I look forward to your greatest assistance.

Yours sincerely,

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APPENDIX D

Questionnaire on Change Management

Questionnaire on Change Management

Section One: Personal and Organizational Information

1. Female or Male

Female _____ Male _____

2. Your Age

_____ 25 – 29 _____ 30 – 34 _____ 35 – 39 _____ 40 – 44

_____ 45 – 49 _____ 50 – 54 _____ 55 – 59 _____ 60 – 64

_____ Over 64

3. What is your education level?
(Please check all that apply.)
_____ MLS
_____ MLS plus other master's degree
_____ Master's degree other than in library science
_____ PhD
_____ MLS plus PhD
_____ Other (please specify)

4. Your position title

_____ Dean
_____ Director
_____ Head Librarian
_____ Librarian
_____ University Librarian
_____ Other (please specify)

5. Number of years at present position
(Please enter the number)

Number of years _____

6. Number of years of all directorship, or deanship (or equivalent)
(Please enter the number)

Number of years _____

7. Number of years involved in all library services
(Please enter the number)

Number of years _____

8. Number of different library professional positions you have held
(Please enter the number)

Number of different library professional positions _____

9. Number of subordinates you oversee
(Please enter the number)

Number of subordinates _____

10. Number of library branches you oversee
(Please enter the number)

Number of branches _____

11. Type of institution in which you work

_____ Baccalaureate college
_____ Master-granting college or university
_____ Doctoral-granting university
_____ Other (please specify): _____

12. Total student enrollment at your college or university:

_____ fewer than 10,000
_____ 10,000 to 19,999
_____ 20,000 to 29,999
_____ 30,000 or more

<< Next>>

Section Two: How You Manage Change

1. Basics

1. Which of the following types of change have you managed?
(Please check all that apply.)

_____ Planned change (also called proactive or incremental change; occurs when distinct changes take place over time and then move to a specific outcome)

_____ Unplanned change (also called reactive change; takes place amidst uncontrolled pressures for change or a mismanaged process)

_____Other (please specify): _____

2. Which of the following approaches have you used to manage change?
(Please rate the following statements on a 1-5 scale: [1] never, [2] occasionally, [3] sometimes, [4] often, and [5] always.)

	NEVER				ALWAYS
A. I realigned the roles, duties, and/or relationships of staff.	1	2	3	4	5
B. I provided training and support for people.	1	2	3	4	5
C. I helped resolve conflicts, negotiated compromises, and/or helped form coalitions.	1	2	3	4	5
D. I told many stories, shared many social events, and/or used a variety of rituals with staff.	1	2	3	4	5
E. I used many task forces or project teams.	1	2	3	4	5
F. I promoted staff's participation and involvement.	1	2	3	4	5
G. I communicated with top-level management concerning change initiatives or projects.	1	2	3	4	5
H. I held celebrations of significant milestones during the change process.	1	2	3	4	5

I. Other (please specify): _____

3. What approaches listed in Question 2 (A-I) have you used to manage change in the following areas?
(Please check all applicable approaches that may be similar to A-I.)

	A	B	C	D	E	F	G	H	I
a. Information technology	__	__	__	__	__	__	__	__	__
b. Library funding	__	__	__	__	__	__	__	__	__
c. Library personnel	__	__	__	__	__	__	__	__	__
d. Public relations	__	__	__	__	__	__	__	__	__

e. Other areas (please specify):

_____

4. How do you assess the effectiveness of change management?
(Please check all that apply.)

_____ I establish an evaluation committee to assess all elements and activities to determine if the implementation of change has attained the identified indicators of change.

_____ I conduct an assessment survey to examine if the implementation of change has attained specified goals and objectives.

_____ I visit all departments related to the implementation of large-scale change to observe whether anticipated improvements have been made in resources, services, and administration.

_____ I assess the effectiveness of change management by reviewing all documents concerning large-scale change projects or programs and interviewing library users.

_____ Other (please specify) _____

5. How strongly do you agree or disagree with the following statements on institutional environments? (Please choose only one response for each statement.)

A. University vice-presidents or provosts like and support library change initiatives or programs.

___Strongly disagree ___Disagree ___Neutral ___Agree ___Strongly agree

B. There are adequate university support funds for library change initiatives or programs in resources and services.

___Strongly disagree ___Disagree ___Neutral ___Agree ___Strongly agree

6.How much time and effort do you spend in managing the following?
(Please rate the following statements on a scale of 1-5: [1] least, [2] little, [3] moderate, [4] much, and [5] most.)

	LEAST				MOST
A. Managing changes in resources, services, and administration	1	2	3	4	5
B. Creating a clear long-range vision and direction for change projects	1	2	3	4	5

C. Presenting and explaining the needs of library changes to university administrators and faculty	1	2	3	4	5
D. Maintaining contacts with university administrators and faculty concerning change projects	1	2	3	4	5
E. Obtaining information on change projects through professional associations and activities	1	2	3	4	5
F. Informing outsiders of the progress of change projects	1	2	3	4	5
G. Negotiating with parent institutions to ensure funding of change projects	1	2	3	4	5
H. Supervising subordinates' work during the change process	1	2	3	4	5
I. Sharing and distributing information on change projects through meetings and personal contacts	1	2	3	4	5
J. Analyzing and introducing the library's need for change.	1	2	3	4	5
K. Dealing with conflicts during the change process	1	2	3	4	5
L. Allocating and coordinating resources for specific change tasks	1	2	3	4	5

M. Other (please specify) _____

7. What changes has your library experienced since you became a director?
(Please check either yes or no for each response.)

	YES	NO
A. Development of staff's new skills	_____	_____
B. Decentralization of power in library administration	_____	_____
C. Reorganization of specific units such as reference, cataloging, and acquisition	_____	_____
D. Downsizing	_____	_____
E. Upgrading technologies and facilities	_____	_____
F. Budget adjustments	_____	_____
G. Policies	_____	_____

H. Other (please specify) _____

8. Which of the following potential changes apply to your library?
(Please check either yes or no for each response.)

	YES	NO
A. Information technology	_____	_____
B. Technical services	_____	_____
C. Library resources	_____	_____
D. Public services	_____	_____
E. Library collections	_____	_____
F. Library personnel	_____	_____
G. Library facilities	_____	_____

H. Budgeting _____ _____
I. Policies _____ _____
J. Other (please specify): _____

9. How do you manage change in information technology?
(Please check YES, NO, or N/A [not applicable] for each response.)

	YES	NO	N/A
A. I manage change through downsizing.	_____	_____	_____
B. I manage change by developing employees' new skills.	_____	_____	_____
C. I manage change through the decentralization of power.	_____	_____	_____
D. I manage change by redefining the meaning of work in high-technology environments.	_____	_____	_____

E. Other (please specify): _____

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II. Approaches to Change Management

Please read the following two change scenarios adapted from Curzon (2005) and answer the corresponding questions according to how you would manage change in each situation.

Change Scenario 1: Succeeding an Unfit Director

Colin has just been hired as the new associate director of an academic library that is riddled with problems. The current director, Ken, has badly neglected the library and has a potential drinking problem. Within the first few weeks on the job, it is clear to Colin that Ken's indifference and complete lack of attention to the job has left a fractured, alienated workforce of low morality and considerable anger. Shortly thereafter, Ken is fired and Colin is named interim director. Colin now faces a real test of his managerial abilities. How can he create a dynamic, committed, service-oriented team that will move the library forward and give people a reason to come to work?
(adapted from Curzon 2005, 119)

10. How would you plan change if you were Colin?
(Please check YES, NO, or N/A [not applicable] for each response.)

	YES	NO	N/A
A. Use planning as a strategy to set change goals and objectives.	_____	_____	_____
B. Use planning as a gathering to promote peoples' involvement and participation.	_____	_____	_____
C. Use planning as a way to approach conflicts and realign power.	_____	_____	_____
D. Use planning in a ritualistic fashion.	_____	_____	_____

E. Other (please specify): _____

11. How would you set goals for change if you were Colin?
(Please check YES, NO, or N/A [not applicable] for each response.)

	YES	NO	N/A
A. Keep change efforts headed in the right direction.	_____	_____	_____
B. Keep people involved and communication open.	_____	_____	_____
C. Provide opportunity for individuals and groups to express their concerns.	_____	_____	_____
D. Develop shared values.	_____	_____	_____

E. Other (please specify): _____

12. How would you approach conflict resulting from Ken's supporters?
(Please check YES, NO, or N/A [not applicable] for each response.)

	YES	NO	N/A
A. Maintain change goals by having authorities resolve conflict.	_____	_____	_____
B. Develop relationships by having individuals confront conflict.	_____	_____	_____
C. Develop power by bargaining, and forcing others to win.	_____	_____	_____
D. Develop shared values and use conflict to negotiate meaning.	_____	_____	_____

E. Other (please specify): _____

13. How would you communicate with the public and your staff if you were Colin?
(Please check YES, NO, or N/A [not applicable] for each response.)

	YES	NO	N/A
A. Communicate facts and information during the change process.	_____	_____	_____
B. Exchange information and needs during the change process.	_____	_____	_____

C. View communication as a vehicle for influencing others. _____ _____ _____
D. Use stories to communicate a vision to individuals involved in the change process. _____ _____ _____
E. Other (please specify): _____

14. What approaches would you employ to manage change if you were Colin?
(Please check YES, NO, or N/A [not applicable] for each response.)

	YES	NO	N/A
A. Communicate and realign formal roles and relationships to reduce confusion and unpredictability.	_____	_____	_____
B. Provide training and support for people who feel incompetent, needy, and powerless because of change.	_____	_____	_____
C. Deal with conflict and form new coalitions.	_____	_____	_____
D. Create rituals	_____	_____	_____

E. Other (please specify): _____

Change Scenario 2: Cleaning up the Cataloging Backlog

A large research library serving a prestigious university has an extensive technical services unit. Technical services processes and catalogs current materials that support the university's curriculum and faculty research as well as many unusual items acquired by special collections. Frank has been recently appointed as director. Frank is in the process of touring the library and speaking with the department heads. In visiting technical services, he is appalled to discover an extensive cataloging backlog. Cataloging of routine materials is backlogged for three years and special collections materials for more than seven years. Moreover, this extensive backlog is considered common and is accepted. However, Frank suspects that the backlog impacts services.

Frank compares his library's situation to that of other libraries with similar budgets. Frank's library is not understaffed; the library actually has more staff than the other libraries. Moreover, the backlog at the other libraries is more extensive. When Frank discusses the issue of backlogs with Sally, the head of technical services, she casually dismisses the problem saying that is the way it is and no one seems to be affected. Frank disagrees and is determined to solve the backlog problem.
(adapted from Curzon 2005, 111)

15. How would you conduct meetings if you were Frank?
(Please check "YES", "NO", or "N/A" (Not Applicable) for each response)

	YES	NO	N/A
A. Occasions for making change decisions	_____	_____	_____
B. Informal opportunities for expressing feelings and building relationships	_____	_____	_____

C. Chances to prove myself and score points with the staff _____ _____ _____

D. Occasions to celebrate and transform the values _____ _____ _____

E. Other (please specify): _____

16. How would you view decision-making if you were Frank?
(Please check YES, NO, or N/A [not applicable] for each response.)

	YES	NO	N/A
A. Use decision-making as a rational sequence to make right change decisions.	_____	_____	_____
B. Use decision-making as an open process to produce commitment.	_____	_____	_____
C. Use decision-making as an opportunity to gain or exercise power.	_____	_____	_____
D. Use decision-making as a ritual to confirm values and create opportunities for bonding.	_____	_____	_____

E. Other (please specify): _____

17. How would you view evaluation if you were Frank?
(Please check YES, NO, or N/A [not applicable] for each response.)

	YES	NO	N/A
A. Use evaluation as a basis for distributing rewards or penalties to control change performance.	_____	_____	_____
B. Use evaluation as a process for helping individuals grow and improve.	_____	_____	_____
C. Use evaluation as an opportunity to score points with the staff.	_____	_____	_____
D. Use evaluation as an occasion to play roles in shared rituals.	_____	_____	_____

E. Other (please specify): _____

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III. Comments

18. Please comment on any approach you have employed to manage change since you became a director.

_____

_____

19. Please feel free to provide any comments regarding the survey questions and design.

_____

_____

20. Would you like to receive a brief report of this survey?

_____ **Yes** _____ **No**

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Thank You for Completing This Survey!

Your views and responses are most greatly appreciated. Thank you for participating in this study. If you have any questions, please don't hesitate to contact me at zhixianyi@mail.twu.edu.

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APPENDIX E

Table 4.4. Criteria for Coding Frame Responses

Table 4.4. Criteria for Coding Frame Responses

Frame	Frame-Related Issues	Frame-Related Actions
Structural	Coordination and control; clarity or lack of clarity about goals, roles, or expectations; references to planning, budgeting, and evaluation; discussion of analysis or its absence (for example, feasibility studies, institutional analysis); issues around policies and procedures.	Reorganizing; implementing, or clarifying policies and procedures; developing new information, budgeting, or control systems, adding new structural units, planning processes
Human Resource	Discussions of individuals' feelings, needs, preferences, or abilities (for example, problems of individual performance or staff quality); references to the importance of participation, listening, open communications, involvement in decision-making, morale; discussion of interpersonal relationships; emphasis on collaboration, win-win, and a sense of family or community	Processes of participation and involvement (task forces, open meetings, etc.), training, recruiting new staff, workshops and retreats, empowerment, organization development, and quality-of-work life programs
Political	Focus on conflict or tension among different constituencies, interest groups, or organizations; competing interests and agendas; disputes over allocation of scarce resources; games of power and self-interest	Bargaining, negotiation, advocacy, building alliances, and networking with other key players
Symbolic	Discussions of institutional identity, culture, or symbols; discussions of the image that will be projected to different audiences; discussion of the symbolic importance of existing practices, rituals, or artifacts (for example, symbolic attachment to an old building on campus); emphasis on influencing how different audiences will interpret or frame an activity or decision	Creating or revitalizing ceremonies and rituals, working to develop or restate the institution's vision, working on influencing organizational culture, using self as a symbol

Reference: Bolman and Deal (1991b, 515)

APPENDIX F

Table 5.17. Parts 1 and 2. Correlation Matrix for Variables Used in the Analysis (Approaches to managing change in information technology) (N=455)

Table 5.17 (Part 1): Correlation Matrix for Variables Used in the Analysis (N = 455)

Approaches to Managing Change in Information Technology

	A	B	C	D	E	F	G
1	.062*	-.005	-.036	.012	-.142****	.131***	-.012
2	.078**	-.058	.034	-.012	-.054	.063*	.012
3	.015	-.077**	-.012	-.068*	-.041	.092**	.068*
4	.030	.098**	-.050	.089**	.014	-.081**	-.089**
5	.018	.026	-.037	.022	.040	-.056	-.022
6	-.035	-.096**	.013	-.099**	-.015	.089**	.099**
7	-.047	-.106**	-.037	-.125***	.024	.071*	.125***
8	-.014	-.190****	-.037	-.189****	-.038	.180****	.189**
9	.116***	-.084**	.004	-.029	-.029	.051	.029
10	.055	-.159****	.050	-.111***	-.048	.131***	.111***
11	.013	-.142****	.083**	-.104**	-.023	.101**	.104**

Notes:

A=Structural, B=Human Resource, C=Political, D=Single, E=Dual, F=Multiple,
G=Single Approaches vs. Dual & Multiple Approaches
1=Male, 2=Age, 3=Education, 4=Years at Present Position, 5=Total Years of Directorship,
6=Total Years of Library Service, 7=No. of Different Positions, 8=No. of Subordinates,
9=No. of Library Branches, 10=Library Type, 11=Library Size
*p≤0.10; **p ≤ 0.05; ***p ≤ 0.01; ****p≤0. 001

Table 5.17 (Part 2): Correlation Matrix for Variables Used in the Analysis (N = 455)

Approaches to Managing Change in Information Technology

	1	2	3	4	5	6	7	8	9	10	11
1	1.000										
2	.024	1.000									
3	.207****	.152****	1.000								
4	.059	.344****	.058	1.000							
5	.167****	.466****	.239****	.642****	1.000						
6	-.008	.636****	.097**	.377****	.500****	1.000					
7	-.077*	.199****	.021	-.161****	-.038	.264****	1.000				
8	.067*	.199****	.213****	-.064	.081**	.188****	.214****	1.000			
9	.035	.085**	.028	-.039	.017	.034	.113***	.265****	1.000		
10	.067*	.169****	.136***	-.055	.040	.159****	.159****	.415****	.298****	1.000	
11	-.022	.133***	.089**	-.096**	-.038	.088**	.178****	.314****	.459****	.517****	1.000

Notes:
1=Male, 2=Age, 3=Education, 4=Years at Present Position, 5=Total Years of Directorship, 6=Total Years of Library Service, 7=No. of Different Positions, 8=No. of Subordinates, 9=No. of Library Branches, 10=Library Type, 11=Library Size
*p≤0.10; **p ≤ 0.05; ***p ≤ 0.01; ****p≤0. 001

APPENDIX G

Table 5.26. Parts 1 and 2: Correlation Matrix for Variables Used in the Analysis (Approaches to managing change) (N = 181)

Table 5.26 (Part 1): Correlation Matrix for Variables Used in the Analysis (N = 181)

Approaches to Managing Change

	A	B	C	D	E	F	G	H	I
1	.146**	.011	.030	-.095	.004	.085	-.160**	.071	-.085
2	.071	-.041	.012	-.032	-.028	-.007	-.022	.033	.007
3	.123**	.042	-.057	-.138**	.021	.058	.055	-.010	-.058
4	-.045	.095*	.153	-.071	.051	.104*	-.041	-.082	-.104*
5	-.037	.085	.046	-.141**	.099	.055	.034	-.104*	-.055
6	-.049	.070	.051	-.015	.066	.068	.051	-.139**	-.068
7	-.080	.008	-.119*	.039	.043	-.058	-.059	.135**	..058
8	.011	-.051	-.105	-.055	.054	-.075	-.011	.102	..075
9	-.044	-.075	.-.039	-.047	.122*	-.080	.076	.014	.080
10	-.045	.025	.049	-.008	.191***	.086	-.174***	.085	-.086
11	-.063	-..089	.023	-.009	.247****	-.021	-.076	.109*	.021

Notes:

A=Structural, B=Human Resource, C=Political, D=Symbolic, E=Other, F=Single, G=Dual, H=Multiple, I=Single Approaches vs. Dual & Multiple Approaches; 1=Male, 2=Age, 3=Education, 4=Years at Present Position, 5=Total Years of Directorship, 6=Total Years of Library Service, 7=No. of Different Positions, 8=No. of Subordinates, 9=No. of Library Branches, 10=Library Type, 11=Library Size

*p≤0.10; **p ≤ 0.05; ***p ≤ 0.01; ****p≤0. 001

Table 5.26 (Part 2): Correlation Matrix for Variables Used in the Analysis (N = 181)

Approaches to Managing Change

	1	2	3	4	5	6	7	8	9	10	11
1	1.000										
2	.029	1.000									
3	.228****	.042	1.000								
4	.117*	.310****	.007	1.000							
5	.178***	.421****	.167**	.641****	1.000						
6	-.043	.631****	-.023	.328****	.450****	1.000					
7	-.153**	.145**	-.043	-.209***	-.119*	.143**	1.000				
8	.070	.269****	.153*	-.069	.056	.174***	.134**	1.000			
9	-.047	.208***	.012	.009	.085	.117*	.062	.284****	1.000		
10	.102*	.190***	.104*	.043	.071	.171**	.091	.452****	.291****	1.000	
11	-.066	.233****	.111*	-.003	-.002	.192***	.200***	.312****	.414****	.481****	1.000

Notes:
1=Male, 2=Age, 3=Education, 4=Years at Present Position, 5=Total Years of Directorship, 6=Total Years of Library Service, 7=No. of Different Positions, 8=No. of Subordinates, 9=No. of Library Branches, 10=Library Type, 11=Library Size
*p≤0.10; **p ≤ 0.05; ***p ≤ 0.01; ****p≤0. 001.