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In this study, I focus on higher education CIOs, their role in the organization, and how this role differs when the CIO is a member of the executive leadership team. Four hundred fifty (450) CIOs of mid-sized, private four-year colleges received a survey, and 51 respondents provided information about their role and perspectives. I interviewed six CIOs on the president's cabinet and six not on the president's cabinet, and used qualitative analysis to compare experiences of individuals in the two case groups. CIOs on the leadership team described different opportunities and approaches than CIOs not on the leadership team. Both groups reported significant benefit to being on the president's cabinet but cited the role of the president or supervisor as being more important.

LEADERSHIP IN HIGHER EDUCATION:

THE CIO ROLE AND THE

LEADERSHIP TEAM

by

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Approved by

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Committee Chair

To Evan and Foster.

APPROVAL PAGE

This dissertation has been approved by the following committee of the Faculty of The Graduate School at The University of North Carolina at Greensboro.

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CHAPTER I

INTRODUCTION

The Research Problem

An institution's leadership team makes key strategic decisions and sets the tone for what the institution represents and how it functions. Members of the leadership team have significant influence on institutional strategy and are seen, in their work with and guidance of the president, as the leaders of the institution. As the scope, role, and impact of technology has increased in higher education, technology advocates have urged that senior information technology (IT) leaders be included as part of a college or university's leadership team, helping to set strategy for the institution. Other than the president, provost, and senior financial administrator, the members of the leadership team can vary significantly from institution to institution (Davis, 2003; Weingartner, 1996), leaving open what additional roles should be represented. Should institutions heed technology advocates recommendations and include technology as one of the common positions on the leadership team? If so, what are the advantages and disadvantages of including a Chief Information Officer (CIO) on the leadership team and what roles should he or she play?

The Research Need

For the past eight years EDUCAUSE, the leading organization for technology in higher education, has run an annual survey to identify top technology issues as perceived

by institutional technology leaders. In the most recent survey, governance, organization, and leadership not only appeared in the top ten overall issues but also ranked in the top ten across three of the four areas surveyed, including strategic importance, future significance, and IT leaders' time (Allison, DeBlois, & Committee, 2008). The survey defines this issue as developing a common understanding of the CIO role, having active participation by IT in institutional decision making, and having active participation by institutional representatives in technology decision making. As this survey illustrates, from the IT perspective the relationship between technology leadership and institutional strategy remains a challenge that will be significant in the future.

The 2006 Core Data Service, which surveyed nearly 1,000 institutions, found that 47. 8% of respondents had a CIO as a member of the leadership team, an increase of two percent (Hawkins & Rudy, 2008). A recent EDUCAUSE Center for Applied Research (ECAR) study surveyed 392 IT leaders in higher education and found that about 48% of CIOs were on the leadership team (Goldstein, 2008a). The ECAR study also found those who were members of the leadership team felt they had greater participation in institutional strategy but that there was no significant difference in perceptions about effective management of the technology division itself. A Gartner study found a slightly higher percentage, with 53% of CIOs on the leadership team (Lowendahl, Zastrocky, Harris, & Brown, 2008a). IT has succeeded in making a case to join the leadership team at many institutions and continues to lobby hard at those institutions that have not yet made the change. This struggle for IT to become part of the leadership team has been under way for some time. Penrod, Dolence, and Douglas (1990) provided a definition of

CIO and outlined the challenges in ways remarkably consistent with Goldstein's study nearly two decades later. Interestingly, their survey of 58 CIOs revealed nearly 40% reporting to a president or chancellor. While they did not ask the question of membership on the leadership team directly, for most CIOs reporting to the president indicates membership on the leadership team. Higher education responded to a corporate trend from the 1980s and developed the CIO position, but the implementation of the senior IT leader as a member of the leadership team has shown minimal growth. Over the past two decades, the number of CIOs on the leadership team has grown from about 40% to around 50%, with most of the increase happening in the last decade (EDUCAUSE, 2010). The role and impact of the CIO needs to be understood better, so institutions can make a conscious decision about their leadership teams with an understanding of the impact the CIO role has in the higher education context.

As the above studies illustrate, existing literature focuses on the IT leader's roles and perceptions but has not looked at what CIOs and institutions experience relative to those roles. Katz et al. (2004) found that CIOs who were members of the leadership team had more interaction with the board and senior leadership and suggesting that they have greater opportunity for positive impact, but again the study is based entirely on perceptions of CIOs rather than explorations of what they were and were not able to do. It is not surprising that IT professionals would believe in the value of being included on the leadership team, but that does not provide clear guidance for whether they should be there or the implications of their involvement. Bates (2000), a prominent advocate for technological change in higher education, argues explicitly that the CIO should not be on

the leadership team, citing the focus on operational needs as opposed to academic mission as a barrier to effective participation. Several articles and commentaries focus on how a CIO can be effective in higher education (Chester, 2006; Hawkins, 2004; Miller, 1991; Zastrocky & Schlier, 2000). Most of these presume that the CIO has gained membership to the leadership team and provide guidance on how to be effective in that role. Much of the literature has defined this role in relationship to the corporate vision of CIO; Lineman (2007), however, argues that although the development of the CIO position in higher education is similar to that of the corporate sector, significant differences exist between the role in the two contexts, warranting further study. Although many of the higher education resources talk about the corporate model as an example, literature from the corporate sector shows that the model is less stable than presumed and that the corporate sector is struggling with the same questions about the role of the CIO on the leadership team (Jones, Taylor, & Spencer, 1995; Polansky, Inagunti, & Wiggins, 2004; Smaczny, 2001).

Research Purpose and Significance

By examining the relationship between the CIO, the leadership team, and technology projects of strategic importance, I explore possible differences in projects based on the CIO's place in the organization. Examining project implementation stories and perceived roles relative to presence on the leadership team, this study provides insight into what it means to be a member of the leadership team. Further, the analysis of CIO roles and technology projects through a multi-case study of institutions that differ in

the organizational placement of the CIO provides a framework for understanding how the CIO's presence on a leadership team relates to institutional perceptions of technology.

The research focus is on the experiences and perspectives of the CIO, particularly in relation to whether or not the CIO is a member of the leadership team. By examining what CIOs perceive their jobs to be, how easy or hard CIOs perceive it is to successfully complete their jobs, and what approaches they use to be successful, we can gain insight into what how a CIO can be successful for a number of contexts. This study focused on presence on the leadership team, but this is only one of the contextual factor that are important for CIOs, and the information about how CIOs complete their work should be useful regardless of one's perspective related to membership on the leadership team.

This study will be of particular interest to those in general higher education administration as well as higher education technology. By seeking to understand technology's role in higher education strategy, this study provides an illustration of the threshold between operations and strategy. At its core, this study addresses a very practical question—Should an IT administrator be part of the leadership team?—but in examining this question, the study provides the foundation for assessing what roles should be part of an institution's leadership team.

CHAPTER II

LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK

In the following chapter, I review the current state of literature related to technology leadership in higher education and establish the conceptual framework for the study. In a section on leadership, I explore structures and practices of leadership in higher education in order to establish the conceptual relationship between leadership, governance, strategy, and technology. Since a study of leadership in higher education is by definition an organizational study, I then place the study within the context of the field of organizational theory and design. Technology has rapidly evolved and expanded within higher education, and I trace how the use of technology has transformed from its initial days as a behind the scenes data processor to its current use as an integrated component of most roles and functions at an institution. In the next section, I build on the history of technology in higher education to focus on the history of the technology leadership position at an institution, examining how the CIO role was established and evolved. For the final section, I apply this context of higher education, leadership, and technology to look at what it means to pursue a seat at the leadership table, as CIOs and others are doing.

The Leadership Team

Although a chancellor or president is usually considered the leader of a college or university, the leadership of the institution is typically comprised of a larger set of people

representing various functions. The positions included on the leadership team—sometimes called the president's cabinet—vary, but the president, provost, and financial administrator serve as a core at most institutions (Davis, 2003; Weingartner, 1996). Bess and Dee (2008) outline a broader core group to include these three roles and enrollment management, student affairs, and external relations. Other possible roles include human resources, technology, facilities or auxiliary services, and research, as well as numerous other positions. The senior positions at an institution can be a window into that institution's strategic vision and those that actively serve on the leadership team.

In some institutions the organizational chart delineates the leadership team, showing a group of people reporting directly to the president. But in many cases, the membership of the leadership team does not correlate directly to the organizational chart—some people who report elsewhere are included in the leadership team and some people who report to the president are not included. For example, the most senior IT administrator has a seat on the cabinet at 48. 5% of colleges and university in the U. S. , while only 29. 9% report directly to the president (EDUCAUSE, 2010). The question is when key decisions are being discussed and made, who is expected to be part of the discussion? Who has a "seat at the table" for leadership team meetings? And if one gets invited to the table, is his or her input welcome for all strategic discussion or just for those discussions directly related to his or her field or specialization?

Leadership itself is a broader concept that need not be tied exclusively to the people in leadership roles. Leadership as a concept or skill has been heavily studied for decades both in and out of academia. Barrow (1977) called leadership "the most

extensively researched social influence process know to the behavioral sciences" (p. 231) and that was over thirty years ago. For purposes of this study, I will focus on leadership being the team of people working most closely with the president and the efforts and decisions of this group. It is important to note that the president of an institution is not the final position of leadership and that the president is typically appointed by and reports to a board (Davis, 2003). Birnbaum (1988) groups the president's role with the board as an institutional function that focuses on how the organization responds "to the uncertainty of external social forces" (p. 18). The bulk of higher education work is completed by faculty and staff at the technical level, and the administration comprises the managerial level, mediating between the work of the technical level and the organizational and external constraints of the institutional level. In this model, the leadership team is the connector between institutional and managerial levels. With one foot on the institutional level and one on the managerial level, members of the leadership team help translate the institutional level response to the management and help keep the institutional level as informed about internal context as it is to the external social forces to which it responds.

To complicate matters further, people move between institutional and managerial levels in higher education more frequently than in most organizations and people may even function in multiple levels simultaneously. Faculty are frequently called upon to serve as administrators temporarily, and many faculty who serve a significant part of their career as administrators choose to return to a faculty role at the end of their careers. Further, many program director and even chair roles are considered part time roles, and the faculty who fill those roles are expected to serve as both administrator and faculty.

Although Birnbaum's (1988) exploration of organizational levels is based on the work of Thomson (1967), the most significant component of his book length study of academic organization is built largely on the concept of loosely coupled systems as presented by Weick (1976). Building on a concept recent to contemporary literature, Weick seeks to clarify the organizational concept of loose coupling and outline how such relationships function in higher education. Loose coupling refers to systems and events that are connected but not in ways that create a predictable cause and effect. The complex organizational structure of higher education with its multiple sources of authority has numerous loose couplings. Weick identifies seven functions and dysfunctions that help explain how loose coupling works within higher education and how it can often be helpful to the higher education mission: (a) allowing portions of an organization to persist without having to adapt to every change, (b) providing mechanisms for sensing change across the system more effectively, (c) creating opportunities for adaptation to local needs without impacting the entire organization, (d) including a greater number of differences across the organization that can facilitate overall adaptation, (e) sealing off failed or failing segments to minimize damage to the whole organization,(f) allowing greater self-determination from individuals, and (g) operating at a relatively inexpensive cost. Birnbaum shows how these principles play out across colleges and universities with different organizational cultures, examining in particular how leadership can function within such academic organizations.

Cohen and March (1986) present an alternate but related view of the president's and by extension the leadership team's role at the university. They describe the

challenges of higher education leadership as containing a series of ambiguities. The ambiguity of purpose relates to the difficulty of encapsulating the goals of the university in a meaningful statement without reducing and oversimplifying the goals. The president is challenged to measure success against generalized goals that defy measurement. The ambiguity of power speaks to the position of power that the president holds while constrained significantly by the fact that the exercise of power is usually a negotiation. The ambiguity of experience refers to the challenge that the speed at which a president can learn from the results of his or her previous actions is often surpassed by changes in context and environment that significantly reduce the reliability of such learning. Finally, the ambiguity of success describes the way in which previous measures of success are turned on their head and are no longer relevant for a university president. Presidents are rarely promoted out of their leadership positions, and as the ambiguity of purpose demonstrates, typical operational measures of success are too vague to be measureable or meaningful. While these ambiguities all focus on the specific role of president, they are shared challenges of a leadership team that works with and advises the president.

Birnbaum, Weick, Cohen, and March all share a view of the university and its leadership as a messy place. This shared vision has served as a common foundation for more recent theories of leadership in higher education (Boyce, 2003; Eckel & Kezar, 2006; Hearn, 1996; Morrill, 2007; Schuster, Smith, Corak, & Yamada, 1994; Smart & St. John, 1996), which offer different applications for how to achieve effective leadership but rely significantly on models of power developed in the 1970s and 1980s. Relationships of power follow dual (or more) lines, and decisions are negotiations that must be managed.

Leadership teams are important in all organizations, but what these teams are able to do varies from organization to organization. In higher education, a leadership team is a hub exerting influence rather than dictating decisions and results. As Kezar and Eckel (2004) explain, “Leadership is a collective of individuals that influences, shapes, and creates change in a particular direction” (p. 385). This is contrasted with governance, which they define as “the process of policy making and macro-level decision making within higher education” (p. 375), while acknowledging most researchers have avoided providing such “clear and precise” definition. In this sense, leadership acts within larger governance structures, systems, and interactions, which will be explored in more detail below. Morrill (2007) argues that a key element of decision-making within higher education is the integration of managed support systems and collegial faculty, in other words, a negotiation across dual lines of authority (Birnbaum, 1988). As all of these theorists argue, part of the strength of academic institutions is derived from the necessity of such negotiations. Realizing this strength without getting lost in the politics of negotiation is one of the key challenges of the leadership team.

Within such a complex, loose, and even anarchic structure, units within the university often struggle to maintain their position, especially if they are not part of the dual authority of administration and faculty. Operational units that support the technical level of doing research, teaching, and service often do not have authority over those support functions, which are led by faculty. Nor do they have authority over the institutional or managerial levels as outlined by Birnbaum. Membership on the leadership team would give such a unit a clearer voice in the institution by providing a direct

connection to the authority of the institutional level. Perhaps more importantly, it would be a symbol that the function of the unit has escalated beyond operational support to something of greater significance to the institution.

Leadership teams are responsible for a varied set of tasks at the university. Continuing with Birnbaum's model of organizational levels, the task of connecting institutional and managerial levels would include communicating external forces to the organization, communicating internal successes to the board, ensuring operational success, limiting external constraints, developing policy, and setting short and long term strategies for ensuring success.

Following Cohen and March's (1986) concept of organized anarchy, leadership would include decision-making and then implementation of decisions through one or more of the eight tactical rules for influencing the adoption of decisions at the institution. In both models, leadership represents a set of actions within a continually evolving context of governance. Figure 1 shows a large box for leadership, which would include the broad domain of responsibility, which is embedded within a larger context of governance. Within the realm of leadership, a significant portion of effort is dedicated to creating, implementing, and updating institutional strategy. In some senses, strategy could be seen as the engine that drives the full range of leadership responsibilities. Alfred (2006) urges higher education administrators to distinguish strategy from tactics and to consider strategy as the long term positioning of the institution, placing the institution optimally so that it can best enact the tactics of short term actions.

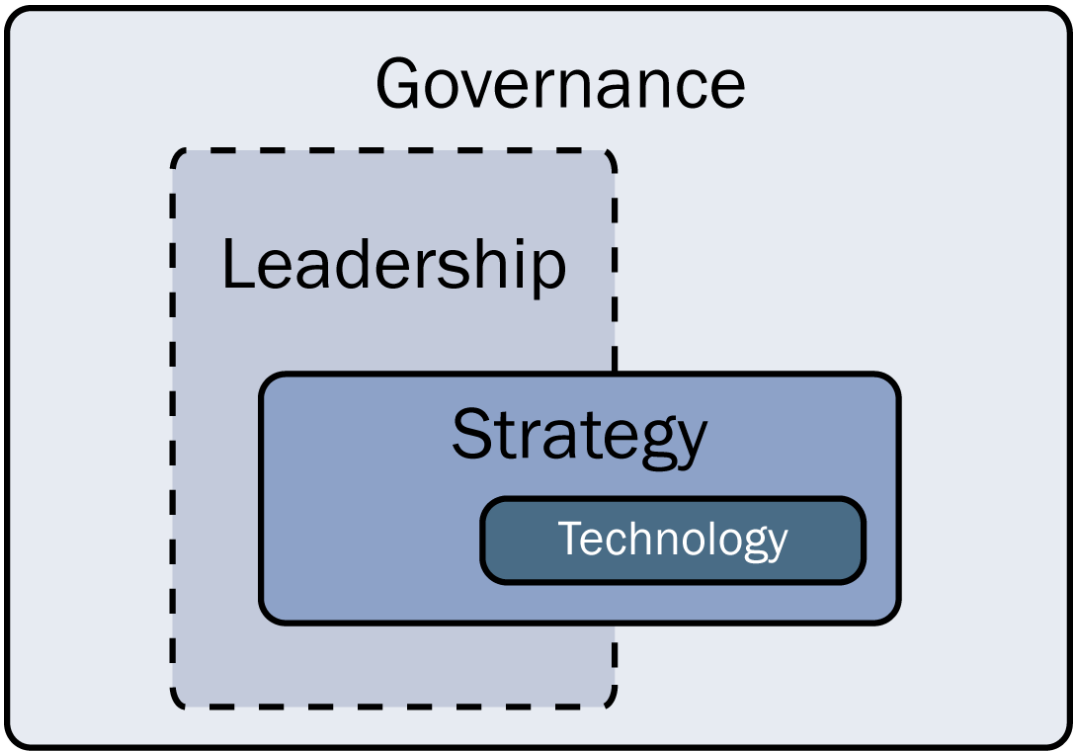

Figure 1. ***Concept Map Illustrating the Relationship between Governance, Leadership, Strategy, and Technology***

Accordingly, the executive team is focused on the long term position of the institution and delegates the short term tactics to operational management. As will be illustrated below, technology now plays an expanded role in institutions and thus is a significant component of developing organizational strategy, a component of long term planning and positioning. Figure 1 shows only a portion of domain of strategy within the domain of leadership, reinforcing the influential rather than controlling relationship between leadership and strategy that occurs within continually defined and redefined contexts of governance. Further, the dashed line or the box around leadership represents the variability of who is expected and supported in taking a leadership role, such as through inclusion on the leadership team.

Leadership of organizations and individuals can also be distinguished from team leadership strategies. Despite the focus on a "leadership team," for this study the team orientation of the leader is less important than who is included directly in the decision-making process. Some presidents may choose to explicitly make many decisions as an individual leader, but organizational reality is not immediately accessible to leaders, and understanding it requires interaction with the work and people of the organization. From a cultural model of governance, for example, governance is conceived as fundamentally a matter of selecting some aspects of the environment as important and then defining them in certain ways. Tierney (2008) provides an example of how meaning making effects organizational change:

> By noting that organizations not only respond to, but also help define, their environment through selective attention and interpretation, we observe once again that organizations are less social fact and more ongoing social definition. And such social definitions will have critical institutional consequences. The public state institution that extends its geographic boundaries and redefines its environment will also have to restructure its curriculum and student services. The institution that interprets its environment in terms of a "town-gown" antagonism will affect how the institution goes about its fundraising. (p. 13)

In this sense, the leadership team is the group of individuals that selects and interprets organizational reality, and it follows that this interpretive process substantially influences a president's decisions. In most cases, this group will indeed function as a team, holding meetings and reaching consensus through discussion, but in either case, membership on the leadership team plays a significant role in interpreting environments and thus setting strategy for the institution.

Studying Organizations

The management subfield of organizational theory and design is a full area of study itself with far too much breadth and depth to be covered extensively in this review. In a sense, the origins of organization theory extend to the earliest notions of management as a field, with the classical management theories that emerged from the Industrial Revolution in the late nineteenth century. Evan (1993) exemplified this broad perspective when he argued for an evolution of organizational theories, starting with Weber's "classical" theory of bureaucracy in the 1940s and moving through open systems theory, resource dependence theory, transaction-cost economics, institutional theory, and organizational ecology. Daft (2004)described this transition as one from mechanical systems to natural or biological systems. Significantly, no single theory has dominated the field but rather a set of theories has evolved that are applied in conjunction or individually in various contexts. At the heart of all these theories is a belief that decisions about the design of the organization will influence what happens in the organization. Classical theories see this as a mechanical process while more contemporary theories look for analogues in natural processes. Both trends focus on how people react within the various processes or systems, often looking to sociology and psychology for tools to better understand and explain the human interactions. Regardless of the theory or theories one embraces, the challenging question is identifying in what ways organizational design influences the organization. For this study, identifying a specific theory is not important, since I am not seeking to explore the system or processes of higher education. This study is not about the design of the higher education institution.

The context of organizational theory and design, however, is an important backdrop for the study since I am focusing on how an organizational design decision—Is the CIO on the leadership team?—appears to influence how the CIO makes meaning of his or her leadership role and behaves within the socially constructed and fluid context of governance.

Accordingly, understanding the specific context of the higher education organization will be critical for this study. The term "organization design" is used more extensively in research related to the private sector. The teaching, research, and service mission of higher education is markedly different from the private sector focus on generating a profit for shareholders, and the resulting organizational structures exemplify these differences. The above exploration of leadership in higher education, however, outlines several of the organizational elements that help explain the higher education organizational context and illustrates how scholars have approached the question of the higher education organization. Peterson (1985) explores a wide range of research in the 1970s and early 1980s that grapples with higher education as an organization. More recently, Bess and Dee (2008) provide a comprehensive review of organizational theory and design as it applies to higher education in their two volume study *Understanding College and University Organization: Theories for Effective Policy and Practice*. They argue for an application of organizational theory that will help administrators to identify patterns of experiences within organizations, reflect upon problems, think systemically, and facilitate decision-making and action. Importantly, throughout their study they show how these applications can work across different epistemological stances, or what they

call “patterns of theorizing,” and they seek to make their contextualization of the higher education organization relevant across positivist, social constructionist, and postmodernist paradigms. It is worth noting that their definition of postmodern, perhaps problematically, aligns closely with critical theory in that the emphasis is on identifying and challenging oppression within organizations. This study embraces their overall definition of organizational theory, focusing on how CIOs, a specific participant in the organization, make sense of their leadership role as they describe how projects they identified as strategically important are implemented at the institution. Further, this study aligns with what they describe as the social construction perspective, which includes the notion that institutional meaning is negotiated by the organization members and parallels the fluidity of the governance concept as detailed below and illustrated in the concept map (see Figure 1).

Specific research on governance parallels research on organizational design and further reinforces the concept of a socially constructed governance context. As Kezar and Eckel (2004) trace in their review of governance research related to higher education, the study of governance has focused primarily on structural concerns (Baldwin & Leslie, 2001; Benjamin & Carrol, 1998; Birnbaum, 1988; Kerr, 1963; Mintzberg, 1979), with a relatively small amount of more recent literature examining the governance process and how people interact within and develop these processes (Clark, 1998; Eckel, 2003). Tierney (2008) has emerged as a dominant voice in current higher education governance literature, focusing on how governance is a social construction held together and shaped through the culture of the organization. Fairclough (2005) and Ayers (2010) temper the

social constructivist focus of Tierney through an application of critical discourse analysis built upon a critical realist perspective of organization design and governance. As some of these very scholars have noted (Kezar & Eckel, 2004; Tierney, 2004), the definition of governance has varied significantly among scholars researching the topic. While Tierney's (2004) compilation of essays *Competing Conceptions of Academic Governance* explicitly takes on the notion of these varied definitions even in the title, the content of the essays illustrates the challenge in that many of the essays reflect the competing conceptions rather than help us move beyond them. That said, a common thread in current governance studies is to push beyond the traditional approach of examining structures and to look at the people involved in governance as actors, as active participants in the communications and activities that constitute governance as well as in how the concept of governance itself is defined and enacted. In this study, I seek to continue this trend by examining the CIO as an active participant in the context of governance, focusing in particular on their self-perception of leadership as manifested through their descriptions of projects and how they perceive and describe their role and decision-making with and/or as part of the leadership team.

Higher Education Technology

The use of computers to support the operations of higher education began in the 1950s and focused on managing administrative data. Universities used card punch machines and tabulating machines, which were replaced by early computers. The growth of these systems caused the creation of management positions that could oversee the processing of data. Ryland (1989) describes the movement from tabulating machines,

which simply performed accounting functions on eighty-column cards, to early mainframe computers with greater complexity and expanded use. She explains how the expansion of these systems created the need for managerial positions, typically called automated data processing (ADP) managers or just data processing (DP) managers. These systems automated manual processes and managed records related to students, personnel, payroll, and other functions that today would be grouped under administrative computing (Vaught, 1989). In 1956, data processing managers gathered together for the first College and University Machine Records Conference (CUMREC). This first higher education IT organization and annual conference lasted for 50 years before being subsumed by the larger EDUCAUSE organization. As the name indicates, the focus was not on computers but on processing data records. After the term "machine records" became dated, the organization referred to its conference as "CUMREC – A Higher Education Administrative Technology Conference," further reflecting its administrative focus (EDUCAUSE, 2006). Computers were also used to facilitate research that required scientific calculations, and government grants became available for computer-based research (Ryland, 1989), but the focus of computer use in higher education was to facilitate managing the large amounts of data related to the administration of the organization.

As the abilities of computers expanded, institutions saw new ways that computers could facilitate administrative work. In addition to automating manual processes, computers provided new ways to understand and process data. The focus shifted from replicating previous processes to expanding the ways with which institutions use data and

information. Ryland (1989) argued that the years from the mid-1960s through the early 1970s represent an era of transition from data to information processing: "*Data* connotes a simplistic recording and processing of transactions and events, and the commonly used title 'data-processing manager' reflected this perspective. On the other hand, information connotes something more: the ability to elucidate or inform as an aid to a process, in this case the decision-making process" (p. 21). As Ryland suggested, the shift in organizational naming conventions from data processing to information systems reflects a conceptual shift in how computers were being used. Applying the use of computers to a broader range of information-related activities increased the need for data warehousing and the creation of larger and more complex computer systems. As this conceptual shift took hold, the need increased for more hardware and software infrastructure as well as more support staff to develop and maintain the new systems.

Starting in the mid-1960s, the focus on computers and their possible application in higher education began to shift. In 1966, J. Barkley Rosser chaired the Committee on Uses of Computers, which drafted a report entitled "Digital Computer Needs in Universities and Colleges." The Rosser Report, as it came to be called, was followed just one year later by a study from the President's Science Advisory Committee entitled "Computers in Higher Education," referred to as the Pierce Report for the chair of the panel that completed the report, John Pierce. Although both reports focused on administrative computing, they were also some of the first places to identify additional opportunities for computers in higher education. As Vaught (1989) describes, computers had been seen as a means to automate intensive manual labor involving data. Rosser

(1966) and Pierce (1967) argue that computers can and should be used beyond administrative systems and should be seen also as instructional and research tools. Hamblen (1971) suggests that these reports influenced the National Science Foundation to create an Office of Computing Activities, which focused on funding computer activities. Although the amount of funding was slow to grow, the use of computers expanded rapidly, with the number of institutions with computer facilities increasing twenty percent in the last half of the decade (Hamblen, 1971). The focus of computer use at this time remained technical and closely connected to math and the continued growth of computer science as a field. Both the Rosser and Pierce reports are the first influential arguments that suggest computers could play a larger role in the university.

During the 1970s at the same time administrative computing became more complex, a new type of computer was developed. The development of a microprocessor chip, which contained all of the circuitry formerly housed in large computer cabinets, enabled the creation in 1974 of the Intel 8080, the first usable microcomputer. Shortly after, the MITS Altair 8800 provided the first computer that could be assembled and customized at home. Although these systems were limited in capability and did not even include a display monitor, they marked a dramatic shift in the focus of computing. Rather than creating large, centralized systems, the computer industry began to focus on creating computers for individual users, the personal computer. Within a few years, personal computers began to resemble what we think of today as the desktop computer.

The development of the personal computer put computers on faculty, staff, and student desks. Although it would take time for personal computer use to become

common, the transition from mainframe systems spread rapidly throughout the 1980s. McCredie (1983) cited the spread of “microcomputers” as accelerating the decentralization of higher education computing resources and projected use among faculty and students would grow to as much as 50 percent by the end of the decade. Consider Robinson’s (1983) prescient vision:

> Let us take this image of the availability of the information processing capability to clerks, business managers, researchers, scientists, educators, and others and extrapolate to the broad universal availability of computers and terminals for all of us. Imagine a time when it will be as unlikely for you to see someone working without a computer terminal on their desk as it is unlikely to see someone working without a telephone on their desk. (p. 7)

Such a reality is of course exactly where we are today with computers on the desk of nearly every type of position throughout the university. But in the 1980s, this was a developing idea. Computers were an office productivity tool used by those who had individual needs for information processing or were part of the institution’s team for processing various types of institutional information. Personal computers were still distinct from terminals that were used to access mainframe systems that handled large administration systems and data. Regular use of terminals extended well into the 1990s, when the combination of increased network and personal computer capabilities eliminated the need for terminal systems.

During the 1980s, the amount of literature on computers in higher education expanded significantly. Technology in higher education began to be seen as an appropriate object of study, and scholars investigated the role of computers across all aspects of the university (Hawkins, 1989). Additionally, the possibility of computers

playing a significant role in instruction gained serious attention (Bok, 1986; Lynton & Elman, 1987). Most of the focus on instruction was on ways to implement technology in the classroom or on software that could be produced and distributed to students (Jones, Kirkup, & Kirkwood, 1993). From today's perspective, it is almost hard to remember that the first decade of personal computers worked largely in isolation, with very few people connecting computers to each other or to larger server systems.

The new type of computer, whether used in the classroom or as a productivity tool, created a whole new set of support challenges for higher education. Personal computers represented a new type of cost that had not existed previously. And with new technology came the need for technology support. People had not used such tools and needed help using them effectively. And early personal computers were particularly prone to technical issues and breakdowns. Skilled technical support was required to facilitate the use of these new systems.

Although the opportunities for computer use in higher education had broadened, the challenges for effective use in administrative support remained. Gillespie and Dicaro (1981) found that over 50% of computer funding in higher education was dedicated to administration. Their report, entitled "Computing and Higher Education: An Accidental Revolution," reflected the mindset of the time. Lengthy claims about the promise and opportunity of computers were interspersed with concerns about the cost and lack of funding. As their title suggests, computers appeared to have been something that happened to higher education rather than an opportunity developed and grown within institutions. Ironically, it was in fact in higher education that computers were developed,

but the road from object of research to operational tool was not one actively managed by higher education leadership. One of the challenges reflected in the Gillespie and Dicaro (1981) report was the separation of new opportunities from current use for administrative support. As Green (1999) argued, IT in higher education had struggled under a "two-culture" problem where computer resources and technology are divided into two separate domains, administrative and academic. This split exacerbated challenges of coordination, support, and cost and reinforced the idea that computers were an auxiliary service rather than a tool integral to the higher education mission.

As personal computers became more powerful, easier to use, and more reliable, their use in higher education and elsewhere expanded steadily. But with the development of a commercial internet in the 1990s, computer use exploded. The development of the internet actually began in the 1960s with university research funded by the Advanced Research Projects Agency, which had been formed as a defense initiative in response to Russia launching Sputnik in 1957. ARPANET was formed to create a secure and reliable network of computers that could be relied upon even during a catastrophic attack that destroyed significant portions of the network. Later versions of this network were opened to commercial interests in 1988. Bulletin boards, Usenet groups, and other communications tools were popular during this time, but the release of Mosaic in 1993 as a web browser launched the beginning of the Internet as we think of it today. By the end of the 1990s extensive use of the Internet for email communication and web browsing became commonplace in higher education. Institutions developed significant presences

on the web and looked for ways to leverage these new technologies to help achieve the higher education mission.

The use of computers as an essential communication tool expanded the roles that needed to have computers. Bates (2000) pointed out that the infrastructure requirements of technology created a new challenge for institutions. Most of these costs were considered capital expenditures, but unlike buildings and other capital expenses, technology infrastructure needs to be replaced more frequently.

As online technology became more commonplace, scholars and administrators saw new possibilities for distance education. Technology became a way to improve and expand teaching and learning in all subject areas (Duderstadt, Atkins, & Van Houweling, 2002; Massy & Wilger, 1998; Weigel, 2002) as well as to increase the breadth and reach of the university (Maeroff, 2002). Using the Internet for distance education created a whole new demand on faculty and staff. Materials needed to be created and maintained in online formats. Faculty could either be trained to produce materials, or staff could work with faculty to produce materials according to their specifications. Either way, significant additional funding and effort was required that had not been part of the traditional higher education enterprise. Companies like Blackboard and WebCT developed course management systems (CMS) to facilitate the development of course materials, process assignments and tests, and enable student discussions. These systems required significant server support as well as integration with student information systems and other components of traditional administration systems. As teaching through the Internet came

into its own, it created a whole new set of technology development and support needs that layered on top of those that already existed for administration and research.

The growth of online instruction created both excitement and fear. As the Internet and World Wide Web went mainstream, the possibilities to exploit these new means of communication for instructional purposes seemed endless. Some scholars saw the Internet as an efficient delivery platform that would allow institutions to develop courses that could be distributed to vast numbers of people with the potential for immense profits for universities (Katz, 1999; Wallhaus, 2000). Moving the learning space online, however, created fear that the instructor could be replaced by the computer, that private companies could essentially buy out the higher education system (Farrington, 1999). Although both the opportunities and fears appear extreme a decade later, these discussions show technology pushing the institution to look at its mission and its values. They show how technology decisions became strategic initiatives that affected the very core of the university.

Today, computers have become an integral part of higher education, and their use continues to grow. The most recent annual survey administered by EDUCAUSE to nearly 1,000 institutions as part of the Core Data Service found increases in computer use and services in almost all categories (Hawkins & Rudy, 2008). The median cost per student across all respondents was $909—the cost of technology has increased significantly from the projected goals in the 1967 Pierce Report, where they urged campuses to spend $60 per student. At the University of North Carolina at Chapel Hill School of Government, we currently support nearly 180 computer systems for a faculty and staff population of

approximately 140. Most people have laptop computers, and they are replaced every three or four years. Computers are part of every person's daily work, supporting administration, research, teaching, and outreach.

Looking forward, the visionaries have become more cautious about their predictions but also more bold about what technology might achieve. Globalization and the ease with which technology can move across international boundaries has created a whole new set of challenges and opportunities for higher education (Duderstadt et al., 2002). Institutions need to decide if they want to take advantage of globalized communication opportunities and then determine ways to support the implementation of new approaches. Internet and other computer technologies continue to advance, forcing institutions to keep pace with new approaches, concepts, and systems, like Web 2. 0, social networking, and server and desktop virtualization (Alexander, 2006; Howell, Laws, Williams, & Lindsay, 2006; Pirani, 2007). Many institutions have begun to rethink how learning happens at universities and colleges and have considered learning spaces that facilitate learning across the whole institution (Oblinger, 2006).

An example of one of the latest trends in computer technologies is cloud computing, which takes applications that formerly resided on personal computers and makes them available on servers that are accessed through the internet. This allows people to access information and tools for processing information from any computer, increases the ease with which people can collaborate and communicate, and expands the types of computers that can process documents to include portable devices. Interestingly, this trend is reminiscent of the terminal and mainframe systems that the increased power

of personal computers made obsolete. Goldstein (2008b) argues that cloud computing may completely change the face of how IT delivers services, much like the personal computer and internet did in previous decades.

As technology advances and changes, the expectations from students, faculty, and staff change, and the opportunities for providing technology resources and services continually shift. Many technologies that were too expensive for most higher education institutions to even consider a few years ago have become inexpensive commodities, creating pressure to expand services further or outsource service to private companies outside the university. The recent transition by numerous campuses, including the University of North Carolina at Greensboro, to move student email and communication services to Google represents this trend. As systems are outsourced, the teams of people that had developed and supported in-house systems will be redeployed to other needs or laid off. Universities have grown large technology support teams that work in a rapidly evolving field where skills and needs must change rapidly. All of these forces create increased pressure for effective personnel management and highlight the importance of technology leadership being closely aligned with an institution's strategic plans.

The evolution of technology in higher education shows its rapid expansion and increasing presence in daily activities and efforts but does not demonstrate what strategic role technology should have. This study focuses on how technology is viewed and implemented as part of institutional strategy. Is technology a cost to be contained? Or is it an investment to be leveraged? Is technology a support service and tool that people use to complete work? Or is it an integral part of the projects and the way people work? The

role of technology has evolved from a core administrative function to something larger, but what does that larger role represent?

The CIO

The most senior information technology (IT) person at an institution is usually called either a Chief Information Officer (CIO) or IT Director. As will be explored later, the choice of title carries significant meaning relevant to this study. First conceived in the early 1980s, the CIO is responsible for participating in organizational strategic planning, information systems planning, information policy, information resources, and new information systems development (Synnott & Gruber, 1981). Penrod et al. (1990) provide the first comprehensive overview of the CIO role in higher education, building on the role as defined in business. They note that most institutions create the role to address dissatisfaction with current information technology management or to give information an elevated role in the strategy of the institution. In his review of the evolving role of the CIO in the corporate world, Gottschalk (2007) argued that a critical role for a CIO is working with other senior leaders to communicate the potential and strategic use of information systems. Although the role has evolved, Gottschalk's analysis demonstrated that the evolution is mostly a honing of a consistent idea—the CIO is the organization's strategic leader for technology and information systems.

Nearly half of higher education institutions have a CIO who actively participates on the leadership team (Hawkins & Rudy, 2008). The trend toward developing a CIO position and including it on the leadership team began in the 1980s and has increased in fits and starts since then. Penrod et al. (1990) estimated that there were over 150 in 1988

and at least 200 in 1990. Their survey of 151 institutions, which received 58 responses, is the first examination of the CIO role in higher education. Through gathering data from people in the most senior IT position at an institution, they were able to create a profile of the higher education CIO and demonstrate how it was clearly still in formation. As they noted, many people fulfilling what might be considered the CIO role did not refer to themselves as CIOs, illustrating just how early the adoption of the concept was in higher education. Pitkin (1993) performed a survey of CIOs in the summer of 1992 with results that suggested a much less influential picture for CIOs. Written in direct juxtaposition to the Penrod et al. (1990) findings, Pitkin argued that higher education CIOs only met a portion of the criteria for CIOs as defined by Synnott and Gruber (1981) and should not be considered as executive officers at institutions. In essence, the increase of higher education CIOs was in name only and not function. He did, however, indicate that CIOs performed the roles of manager, futurist, and strategic planner, thee of the nine roles identified by Synnott and Gruber. A decade later, the focus had shifted from whether an institution had a CIO position to how that position functioned, and in particular, whether that position was a member of the leadership team.

No formal surveys were published until a 2004 EDUCAUSE Center for Applied Research report. A 2001 informal study of 150 CIOs found that 47% of respondents were members of the leadership team (Cain, 2001). The 2004 formal study (Katz et al., 2004) submitted a web survey to 13,000 people and received 1,850 responses from IT professionals. The study found that 50. 6% of the 330 most senior IT leaders surveyed were members of the leadership team and that members of the leadership team had

significantly greater access to the highest levels of institutional management, with nearly 80% meeting regularly with the president compared to 28% of non-members. Other factors that were compared by membership included responsibility, institutional planning activities, and a self-assessment of identified success criteria. Although the percentage of members reporting responsibility in various institutional areas was higher for members than non-members, the difference is minimal for the majority of areas, with only the library, instructional development, and voice communications having greater than a 10% difference. For institutional planning activities, the differences became greater between members and non-members, with only the publishing of institutional and IT plans having less than a 10% difference. Perhaps the most telling difference between CIOs was involvement in non-IT institutional decisions, with 60. 8% of members reporting they "almost always" are involved compared to 15. 1% of non-members. The self-assessment of success criteria continued the trend, with leadership team members reporting agreement with the statements in greater numbers than non-members for almost all of the prompts within the shape demand, set expectations, deliver, and lead categories of success. It is important to note that while the 2004 study paints a picture that indicates strongly that membership on the leadership team has a positive impact on the role of the CIO, all of the respondents were CIOs. What the study lacks is any perspective outside of IT, or even the CIO role for that matter. While CIOs may believe that they are more effective when on the leadership team, other members of leadership may not agree. The self-assessment by CIOs does suggest that membership on the leadership team gives CIOs a greater sense of involvement and ability.

Building on the work of the 2004 study, the EDUCAUSE Center for Applied Research sent a web survey to nearly 20,000 people in 2007, publishing the final study in 2008 (Goldstein, 2008a). The study had 3,100 respondents as well as two focus groups. All participants were IT professionals, and of the 391 CIO respondents, 47. 8% reported being members of the leadership team. The study found that CIOs on the leadership team reported greater participation in institutional decision making as well as greater confidence in the quality of IT services and the alignment of services with institutional strategy. The study was not able to determine if the membership on the leadership team facilitated greater leadership or if positions with that role attracted better leaders. Interestingly, membership on the leadership team did not appear to impact organizational effectiveness within information technology. CIOs reported the same level of effectiveness in managing teams regardless of leadership team status. The 2008 study spent some time examining transformational leadership criteria but found no significant difference in transformational leadership scores by leadership team membership. Although not claiming that membership was essential for successful IT leadership, the study did find that CIO membership on the leadership team contributed to effective leadership. Once again, this study focused entirely on the IT perspective and did not consider other members of the leadership team or elsewhere at institutions.

In 2007, Gartner conducted a global survey of higher education CIOs, publishing the results in several reports in 2007 and 2008 (Lowendahl, Zastrocky, & Harris, 2008; Lowendahl, Zastrocky, et al., 2008a; Lowendahl, Zastrocky, Harris, & Brown, 2008b; Zastrocky, Harris, Lowendahl, & Brown, 2007). The survey had 173 CIO respondents as

well as 28 responses from people to whom the CIO reports. Interestingly, the Gartner survey was the first to consider a perspective beyond that of IT professionals, but unfortunately the response rate was so low that very little of the data can be found in any of the reports. A question that elicited a meaningful response was regarding the most important competence CIOs should develop to enhance IT's contribution to the institution (Lowendahl, Zastrocky, et al., 2008b). Executives responded that CIOs need an understanding of higher education community combined with IT knowledge and effective communication and people skills. While technology was referenced, it is telling that the emphasis was on institutional knowledge and interaction. One report focused entirely on the question of whether the CIO was a member of the leadership team (Lowendahl, Zastrocky, et al., 2008a) and found that 53% of CIOs reported being members of the leadership team, with an even greater percentage of North American higher education CIOs reporting membership. The report also looked at numbers of CIOs reporting directly to the CEO or president of institutions (31%) but found that a place on the leadership team was more important for participating in institutional leadership. The authors argued strongly that CIOs should be present on the leadership team and suggested one barrier could be in CIOs themselves needing to show more focus on institutional concerns rather than just infrastructure and administrative support. While the inclusion of perspectives outside of IT strengthens the survey results, the low response rate by executives to whom CIOs report limits how broadly the results can be understood and applied.

In addition to these studies that have explored the technology leadership position, the EDUCAUSE Core Data Service (EDUCAUSE, 2010) has been surveying institutions for the past seven years about a wide array of technology organization and implementation data. One question included in all years of the survey is whether the CIO "sits on the president's cabinet." As Table 1 illustrates, the number of CIOs serving on the leadership team has grown, but the growth has not been substantial or consistent. The Core Data Service reports do not provide any analysis of the percentages in a given year or of the changes from year to year, other than to note that the number of CIOs on the leadership team is significantly greater than those reporting directly to the president or chancellor. The data is reported by institutional type following Carnegie classifications, but the relative differences between institutional types remained fairly constant from year to year.

Table 1. ***Percentage of CIOs on the Leadership Team by Year****

2002	2003	2004	2005	2006	2007	2008
43. 6%	44. 0%	46. 5%	46. 2%	47. 8%	49. 0%	48. 4%

* as reported through the EDUCAUSE Core Data Service Summary Reports

In higher education, the establishment of a CIO position typically connotes two important institutional responsibilities: (a) the CIO is responsible for technology use and support across the institution, including departments and divisions that do not report directly to a centralized technology organization; and (b) the CIO is by definition a member of the institution's leadership team. IT Directors, on the other hand, frequently

have a more limited scope of responsibility and authority. They are typically responsible for whatever services are provided by the central IT organization and may or may not be part of an institution's leadership team. In most organizational hierarchies, IT Directors report under the finance or administrative units of the institution, in keeping with the administrative support origins of IT at most institutions.

The location of the CIO or IT Director is a key variable in this study and is represented by the dotted line around Leadership in Figure 1. The placement of the most senior IT person on or off the leadership team changes how leadership functions at that institution and has a ripple effect through the concepts of Strategy and Technology. As Weingartner(1996) states in one of his maxims for higher education organizational leadership: "To what position a given officer reports significantly affects the way in which his or her responsibilities are discharged" (p. 5). Weingartner argues that both the increased status of reporting to a president and communication of priorities and values are primary drivers for these differences. This study seeks to understand the reasons for differences in the organizational location of the most senior IT administrator and the impact it has on the leadership, strategy, and technology of the institution.

IT leaders have argued for some time that the most senior IT position should be a CIO and that the person should be a full member of the institution's leadership team. Miller (1991) emphasized the importance of a CIO working with all levels in the organization and argued that this required reporting to the president or provost. Zastrocky and Schlier (2000) argued that successful participation on the leadership team would be critical to a CIO's success as well as to the effective positioning of IT at an institution.

Cartwright (2002) urged CIOs to apply their technical expertise as needed but also to work as part of an executive team with broader strategic goals. Hawkins (2004) provided a framework for the CIO position that is built on its executive leadership role within the institution. Broadbent and Kitzis (2005) stated that today's CIO is at a crossroads between becoming a technician or a strategic leader, urging CIOs to accept the challenges of leadership and active participation with and among the leadership team. Chester (2006) argued that the greatest challenge facing CIOs is becoming a technology advocate and institutional leader rather than a leader of technicians.

Although the distinction between CIO and IT Director role is significant, the actual title can vary significantly, often adopting the institution's respective academic hierarchical titles of Vice Chancellor, Vice Provost, or Vice President (Goldstein, 2008a; Katz et al., 2004; Penrod et al., 1990). The focus for this study is on the most senior IT leader at an institution, regardless of title. For the sake of simplicity, the remainder of the study will refer to the most senior leader as CIO. Although the title of CIO can suggest membership on the leadership team, it does not necessarily guarantee such membership. I will use CIO as a generic term, which should help keep the focus on the difference in organizational location rather than potentially misleading titles.

Although many IT professionals working within higher education perceive the role of CIO in the corporate sector as well established, it has and continues to be questioned and reconsidered. The private sector role of the CIO began as an extension of existing operational responsibilities. Prior to the establishment of the CIO role, Keen (1981) identified a need for information systems management to have greater authority

and political access, which aligns with Synnott and Gruber's (1981) definition of the role. Based on a review of existing literature, input from fourteen field experts, and a special meeting of the research team with an additional five field experts, Rockart, Ball, and Bullen (1982) projected the evolving role of the newly formed CIO position, identifying three key changes: (a) less direct management of people completing technical work, (b) increased focus on how information is used by staff across the organization rather than how specific technology projects are being completed, and (c) responsibility for information resource policy and strategy. The emphasis on information over technology is worthy of note in early conceptions of the role. Benjamin, Dickinson, and Rockart (1985) surveyed 25 large organizations to test the predictions made a few years earlier, and their findings supported the overall role envisioned. The study provided a clear indicator that the CIO role in the private sector was beginning to take hold and that the trend was toward a conception of an executive-level position with responsibility for issues that impact the entire organization.

Gupta (1991) reviewed literature from the previous decade and earlier to support an argument for an increased CIO role in strategy by developing a close partnership between the CEO and CIO. In the early 1990s, 60 to 70% of businesses had adopted the role (Gottschalk, 2007), double that of just a decade before (Grover, Jeong, Kettinger, & Lee, 1993), which may explain the perception of the prevalence of the CIO role in the private sector. Jones et al. (1995) found that although CEOs in their study of motor carrier companies reported satisfaction with CIO activities, information systems were not part of strategy formulation, indicating that even those who had achieved the title of CIO

may struggle to be an active participant in business strategy. On the other hand, Karimi, Gupta, and Somers (1996) found that the competitive strategies of businesses were related to the position and role of the firm's CIO. In other words, an executive level CIO has an impact on the stated strategy of an organization.

Over the last decade, the trend of CIOs reporting to CEOs in the private sector has been inconsistent (Mahoney, 2009), and the debate about the role and importance of the CIO continues. Some researchers have begun to question the strategic importance of the CIO (Carr, 2003; Ross & Weill, 2002). Polansky et al. (2004) cite challenges facing CIOs whose organizations see their focus as IT rather than organizational strategy. But most research focusing on the private sector suggests that the role will continue to grow as a strategic influence, in a sense catching up with the spirit of the title created nearly 30 years ago. Several researchers have focused on the importance of strategic alignment between business and IT efforts (Byrd, Lewis, & Bradley, 2006; Hunter, Prentice, & Meehan, 2009; Kearns & Sabherwal, 2006; Philip, 2007; Smaczny, 2001). Preston, Chen, and Leidner (2008) take the argument a step further, demonstrating how a CIO's strategic decision-making authority can impact the value of IT's contribution to the organization. Others have focused on the importance of the CIO as a member of the leadership team, arguing that a CIO should report to and operate within the highest levels of the organization (Cecere, 2001; King, 2008; Nolan & McFarlan, 2005). Finally, some have argued that one of the key roles for the CIO will be to serve as a change agent for the organization (Broadbent & Kitzis, 2005; Weiss & Anderson, 2004). While the private sector has achieved greater success than higher education in establishing the CIO title, it

does not appear to have achieved more success in adopting the role as strategist and organizational leader, especially considering that some of the alternative titles available in higher education imply the same level of leadership as proposed by the title CIO.

Similar to higher education, the public sector has appropriated the title of CIO and struggled to identify the appropriate role and place. Adoption in the public sector was influenced more by legislature than by best practice or trend. In 1996, Congress adopted the Information Technology Management Reform Act (P.L. 104–106), also known as the Clinger-Cohen Act, which legislated a set of strategic information management practices proposed by the General Accounting Office, including the establishment of a CIO position for each federal agency. Significantly, these mandated approaches were developed through analysis of best practices found in private and public sectors. After some initial struggles implementing the law, the CIO role eventually became a standard component of federal government hierarchy (McClure & Bertot, 2000). Although local governments did not immediately follow the federal government's lead (Fletcher, 1997), the role of the CIO has recently gained prominence in city and county government and appears likely to continue growing in usage (Shark, 2009). Westerback (2000) assessed the impact of the Clinger-Cohen Act through an examination of 20 case studies of projects that had been identified as successful. Responses demonstrated a lack of influence from the CIO and suggested that although legislation created a CIO position, individuals have struggled to gain an agency's perception of the role as having strategic importance. Even with a legislated mandate, the role of the CIO has been contested and struggled in implementation and practice. In this study I focus on the CIO role as it

functions within higher education, but it is important to note that the question of whether an IT professional belongs on a leadership team is not exclusive to academia.

A Seat at the Table

Technology is not alone in its pursuit of a seat at the leadership table, and other units in higher education have struggled to become members of the leadership team. Weingartner (1996) notes that "numerous" administrators could make a claim for reporting to the president and analyzes the institutional impact of the reporting relationship for an activities director and a development director. Selden and Jacobson (2003) provide a recent study of human resources in the leadership of government and non-profit organizations, highlighting the challenge existing organizational entities have when attempting to become an active part of strategy. They argue that the identity of a unit falls along a continuum of Administration, Support, and Strategy. Moving up through this continuum can be challenging, especially when the administrative or support functions must still be maintained. Organizations struggle seeing the new role as appropriate and valuable when their conception of the unit is based on the functional roles. Similar to human resources, technology started as an administrative support function. As data processing became information processing in the 1970s, technology became an operational unit. IT professionals argue that the ubiquity of information technology that came with the personal computer and internet have escalated the role of information technology to strategy. But many see the former administration and support functions as the core purpose of technology and view strategy as over-reaching technology's appropriate bounds. Although IT has grown in importance and use in

organizations, its use and planning related to its use has tended to focus on operational issues. Only recently are organizations considering IT strategy as something extending beyond tactical and operational issues (Kitzis & Mahoney, 2008). In this study I examine these opposing viewpoints in action, analyzing how the governance context and leadership actions are described by CIOs as they seek to make meaning of their role in relation to the construct of the leadership team.

CHAPTER III

METHODOLOGY

Following a comparative case study design, I analyzed the experience and perceptions of CIOs who are implementing what they identify as strategically important projects and consider their descriptions relative to their presence on the leadership team. In the following chapter, I describe the methodology that was used in the study, starting with a rationale for a qualitative research design, the role of the researcher, and the ethical considerations of the study. Institution and interview participant selection processes are outlined, followed by a description of study measures and the process for collecting data. In the analysis section, I explain how the data was examined and compared to create a meaningful understanding of the institutional cases and of the relationships between cases and case groupings. Finally, threats to validity are explored and potential study limitations are discussed.

In this study, I focused on CIOs, their role in the organization, and how this role differs, if at all, when the CIO is a member of the executive leadership team. Many IT professionals contend that a seat at the table is critical to the success of a twenty-first century institution, but they are not alone in their desire to be included at a table with limited seating. Although this study may have implications for other fields, the focus is on technology and the role of the CIO. As Figure 1 illustrates, technology and strategy are part of a larger set of leadership responsibilities that operate within a governance

context, and my intent was to explore how these responsibilities are enacted when technology leadership is brought to the same level as institutional leadership. Through a survey, website analysis, and interviews, I addressed the following research questions:

- How do CIOs experience implementation of strategically important projects?
- How do CIOs' experiences differ, if at all, based on their position in the organizational hierarchy?
- How are IT divisions involved in technology strategies and projects, and how does this differ when the CIO is a member of the leadership team?

Qualitative Rationale

I used qualitative methodologies for this study in part due to my epistemological stance and in part due to the research questions themselves. My epistemological stance has been shaped significantly by my experience as an English graduate student with a focus on literary theory. While the connection may not be apparent at first, much of my work explored representation, reality, and interpretation. My theoretical framework in the study of literature was heavily influenced by reader response theory, cultural studies, post-colonial studies and other post-structural approaches to reading and meaning making. The overlap in theoretical approaches to the study of literature and the study of education is not surprising but nonetheless striking. Accordingly, I find myself drawn to methods of study that account for multiple perspectives of observable phenomena. As Eisner (2001) articulates in his argument for approaches that seek understanding without seeking ontological objectivity, I find the claim that we can understand reality through an attempt at objective observation problematic and appreciate his application of such an

epistemological viewpoint to the study of education. Rather, I believe we can understand tendencies that are influenced by a rich context, and my approach is particularly informed by phenomenological perspectives, which frequently focuses on how meaning is presented through experience (Giorgi, 1997; Groenewald, 2004; Polkinghorne, 1989). Qualitative research is ideally suited for such an epistemological stance that emphasizes the impact of the context of both the observer and observed. In accordance with the epistemological approach in many qualitative studies, validity for this study focused on finding tight connections and logical flows of thinking rather than making sure another researcher could replicate the results.

In addition, I have identified research questions that can be explored in greater depth with qualitative approaches. My research is focused on understanding the experiences of CIOs. While there may be ways to quantify experience, the most meaningful responses to the research questions will come from letting CIOs speak for themselves and being open and sensitive to how they articulate and perceive their own experiences. Qualitative research methodologies provide tools designed to analyze such rich sets of data in ways that identify trends while preserving uniqueness within the story each set of data represents.

The focus on CIO experiences is not just an epistemological bias but is also the result of a practical focus that comes from being a practitioner, from being a CIO. I am eager for results I and other CIOs can use. Understanding the trends of opportunities and challenges for CIOs implementing technology projects they identify as strategically important could aid others as they work to implement projects in their own specific

contexts. Rather than measuring an opportunity or challenge, the study may find some benefits of CIO presence that are offset by risks or barriers. By maintaining a nuanced and context-sensitive interpretation, the findings of the study should be more easily applied by practicing CIOs, who will be able to exercise judgment to determine how much of the context of these stories matches their own context and how that awareness can help them in their own efforts, regardless of their position relative to the leadership team.

Role of the Researcher

As the current CIO of the School of Government at the University of North Carolina at Chapel Hill, I have a personal and professional interest in the research questions as well as experience with a set of answers unique to my own experience. Prior to working at the School of Government, I held a senior IT management position at the School of Public Health, also at the University of North Carolina at Chapel Hill. Part of why I moved across campus was the School of Government's choice to include the CIO as a member of the leadership team, which was and still is not the case at the School of Public Health. In my own professional experience, I have perceived a benefit to being a member of the leadership team, which matches the general consensus of my fellow IT colleagues.

The bias of IT professionals such as myself toward including a CIO on the leadership team is well documented in the literature. This study focused less on the perceptions of IT professionals and more on the patterns of behavior and roles based on the CIO's presence. So while I needed to consider how my experiences and biases

influence my understanding and analysis of the case studies, the focus of that analysis should have helped temper any preconceptions I brought to the study.

As a researcher, the focus of my previous work has either been in the field of literature or in practical scholarship about instructional technology rather than the exploration of social science research questions. First, it was important to view the entire scope of technology issues and not be drawn too quickly into an instructional technology focus. My professional work has extended beyond instructional technology for many years, so maintaining the broader conception of higher education technology felt natural. Second, I needed to use qualitative research approaches grounded in established theory and practice, since I have not yet developed the experience necessary to deviate effectively from established practices.

An ethical consideration of the study involved gauging the motives of the CIO. If he or she saw participating in this study as a means to achieving a goal, particularly to getting on the leadership team, the data could be less reliable since his or her interview responses might focus on attempts to position him or herself. I needed to be cautious about my own role in setting expectations with CIOs. If through communicating the purpose of the study I was not clear that the goal is to explore leadership and technology strategy, I could have created false expectations with CIOs that they will have a tool for change. Especially since I am likely to agree that they should be on the leadership team, I needed to be cautious even in casual conversations or planning communications that the intent of the project remains clear.

Participants

Higher education institutions vary significantly in focus, size, and approach, creating a number of different contexts for managing IT within an institution. This study attempted to limit such discrepancies in order to delve more deeply into how technology and institutional strategy relate at the institutions studied. Private colleges and universities with student populations ranging from 1,000 to 5,000 students provided a common scene for study. I selected the student population range to identify institutions that were large enough to have a sizable centralized technology infrastructure but not so large that the technology organization would include significant decentralized components in addition to the central organization. State supported institutions were not included because the eccentricities of state systems could provide misleading results about how technology is integrated in the institution. The limitations and requirements of funding at state institutions could create increased or decreased amounts of spending on technology, creating the appearance of a strategic priority even though the decision may be driven by external forces. Similarly, research institutions were not included because a high level of research focus at an institution frequently requires a greater proportion of technology spending. Also, individual grants can vary greatly in their technology needs, and the infrastructure and support provided may relate more to individual projects than to institutional strategies.

The specific institutions for the study were selected based on data from the Integrated Postsecondary Education Data System (IPEDS), which provides extensive information about all institutions participating in federal student financial aid programs.

Using the IPEDS DataLab tool with data from the 2007-08 National Postsecondary Student Aid Study, I filtered data to identify institutions that met the profile of a private, four year or above institution with a student population of 1,000 to 5,000 and a Carnegie classification of Baccalaureate Colleges or Masters Colleges and Universities. In the IPEDS data set, 585 institutions met these criteria. The name and email address of the most senior IT leader was identified by reviewing each institution's website. Not all institutions have contact information available through the public website, and these were excluded from the study. I sent an invitation to complete the survey to CIOs at the remaining 450 institutions. Responses to the survey provided both data for analysis and a population from which to draw a smaller sample of institutions where CIOs can be interviewed. Only CIOs who self-selected willingness to participate in a follow-up interview were included. The potential respondents were reviewed based on whether they were able to identify initiatives that were strategically important to the institution. Although this did not exclude any participants, it ensured that participants are involved in projects they perceive are of at least some strategic importance to the institution. In this way, my research focus was on institutions as sites of strategic IT projects and the patterns of experience related to the position of the CIO in the organizational hierarchy. The remaining respondents were divided into two groups based on membership on the leadership team, which was identified in the survey. The participants in each group were randomized. The top six CIOs from each group were called for interviews. Additional interviews would have been identified if needed by continuing down the randomized list.

Prior to each CIO interview, the public websites for the institution and IT division were reviewed and screen shots were taken of each institution and IT division home page.

Data

Data were collected through interviews, surveys, and review of web sites. After verifying they were the most senior IT leader at the institution, survey respondents selected the most important roles for the CIO position, identified the two most important IT projects implemented in the past year, stated if the CIO is a member of the leadership team, and indicated willingness to participate in a follow-up phone interview (see Appendix A). The CIO roles that respondents could select were developed based on possible roles identified by Chester (2006), Goldstein (2008a), Hawkins (2004), and Zastrocky et al. (2007). The survey was also piloted with a group of IT leaders at UNC Chapel Hill, and the possible roles were revised based on their feedback.

Prior to the interviews, I reviewed each institution's home page and IT division home page. This preparation provided additional context to facilitate communication during the interview but also provided data relevant to the research questions (see Table 2 for the Data Planning Matrix). Where did technology appear on the home page? How was it presented? Was there a dedicated IT website? If so, what was emphasized on that site? These questions were based on best practices in web design as published by the U.S. Department of Health and Human Services (2010), which includes typical approaches for designing web sites and pages that reflect the relative importance of the information being presented. Answers to these questions provided an illustration of the strategic place of IT in the organization. For example, a link to a dedicated IT website that appears near

the upper left corner of a web page, is larger in size than other text or links, or has a contrasting color is being emphasized and would have been considered of importance on the site. Similarly, an IT website that focuses entirely on technical support rather than any descriptions of strategic role may be an indicator of how technology is perceived at the institutions. None of these measures were strong enough on their own to make an assessment of technology's strategic role at an institution, but they did provide information to support or temper responses from CIOs during the interviews.

Table 2. ***Data Planning Matrix***

	Data				
Research Questions	**Survey**	**Interviews**	**Website**	**Analyses**	**Utility**
How do CIOs experience implementation of strategically important projects?	X	X	X	Thematic analysis; critical incident technique	Identify patterns in CIO descriptions of experience.
How do CIOs' experiences differ, if at all, based on their position in the organizational hierarchy?	X	X		Thematic analysis	Identify differences in identified patterns of experience relative to the CIO position.
How are IT divisions involved in technology strategies and projects, and how does this differ when the CIO is a member of the leadership team?		X	X	Thematic analysis	Identify patterns of perceived IT involvement relative to the CIO position.

The primary focus of the study was on data from semi-structured interviews. I interviewed each institution's CIO following the CIO Interview Protocol (see Appendix B). The interview protocol was piloted with one CIO on the leadership team and one CIO not on the leadership team to ensure that questions were meaningful to respondents and resulted in the types of responses the questions were designed to elicit. The pilot interviewees were members of the study sample, but their interview data was not used in analysis. During this interview, I gathered data regarding the way the CIO viewed his or her role, the IT division's role, his or her involvement in strategic planning, and projects identified as strategically important. Questions were written to provide additional contextual background for the CIO and his or her perceptions and to apply the critical incident technique through their descriptions of the implementation of one or two specific projects. The use of critical incident technique is discussed in the Procedures for Data Analysis section below, but it is important to note that the initial conception of the technique (Flanagan, 1954) focused on data from direct observers of others' behaviors. The technique has since evolved to focus entirely on self-reporting of incident participants (Butterfield, Borgen, Amundson, & Maglio, 2005), which was the majority of incident data gathered in this study.

Procedures for Data Collection

An invitation to participate in the survey was sent to all 450 respondents that met the criteria established in the "Participants" section. The survey was built, distributed, and managed using the Qualtrics survey tool made available through Odum Institute for Research in Social Science. Respondent information was entered as a panel within the

secure system to allow for use of the Qualtrics distribution system. Respondents had the option of completing the survey or opting out of any future messages about the survey. Respondents who had not completed the survey and had not opted out received a reminder about two weeks after initial notification. The survey was closed three weeks after initial notification. Survey responses were analyzed to identify potential institutions that were randomly selected for additional study.

Website pages were reviewed for all of the 12 institutions that participated in interviews prior to the actual interviews. The institutional home page was examined with a focus on if and how technology was mentioned on the home page and the appearance, location, and text of a link to the IT division website or other technology resources. The IT division website was reviewed, if a dedicated site existed, with a focus on how the division was described and what kinds of projects and services were listed. Screen shots from web sites were taken, and a summary of web site attributes was written following the Web Site Review Protocol (see Appendix C). Summaries were imported into nVivo for tagging and analysis.

Interviews were conducted over the phone and were recorded using a handheld digital recorder. Recorded files were transferred to a laptop computer, which is securely backed up through Iron Mountain backup service, and were copied to an external hard drive. Files were submitted to a transcription service, and completed transcriptions were reformatted and stored as a separate file for each institution. The text from all files was imported into nVivo for tagging and analysis.

Procedures for Data Analysis

This study used a cross-case synthesis approach for multiple case studies (Yin, 2003) that were built using critical incident technique (Butterfield et al., 2005; Flanagan, 1954) as a key component and comparing cases against the variable of CIO presence on the leadership team. Pattern matching was used within each case and each case grouping to increase internal validity (Yin, 2003). If pattern matching analysis had found substantial differences within an initial case grouping, then additional cases would have been added until a clearer pattern emerged through saturation or it was determined that no clear patterns exist for the grouping. Pattern matching involves developing a theoretical proposition that is matched to data from the case (or found not to match). The conceptual framework for the study informs the set of propositions that was used, including roles for the CIO, roles for the IT Division, approaches for implementation and decision-making, and disposition of the CIO. The proposition framework was reviewed by a technology leadership expert to ensure the framework represented realistic and appropriate practices. In addition, critical incident technique was used to review the proposed framework and to modify the initial propositions to create the final proposition framework. Tables 3, 4, 5, and 6 outline the propositions that were included for matching patterns found within the CIOs' descriptions and perceptions. Cases were comprised of data from interviews as well as the survey response and website documents.

Table 3. ***Theoretical Propositions for CIO Role***

CIO Role	Proposition Definition
Technologist	Focus on doing actual technology development and support.
Strategist	Focus on how efforts and projects fit within the larger organization, considering long term operations management and achievement of mission.
Facilitator	Focus on bringing together people with different interests and helping identify common needs and solutions.
Educator	Focus on helping people better understand technology, including opportunities, implementation, and costs.
Manager	Focus on providing oversight for a team of people who provide technology development and support.
Implementer	Focus on ensuring technology development and support projects are completed successfully.

Table 4. ***Theoretical Propositions for IT Division Role***

IT Division Role	Proposition Definition
Functional Support	Provide technology development and support to help faculty, staff, and students do their work.
Operations Improvement	Identify and provide technology solutions that help the faculty, staff, and students do their work better.
Innovation	Provide technology solutions that help the institution provide new approaches to achieving its mission or be considered by peers as an innovative institution.
Strategic Partner	Serve as an integral part of the strategic plan for the institution and for facilitating progress with strategic initiatives and direction.

Table 5. ***Theoretical Propositions for Implementation Approaches***

Implementation Approaches	Proposition Definition
Top-Down	A position higher in organizational hierarchy makes decisions and tells positions lower in organizational hierarchy what to do.
Bottom-Up	A position lower in organizational hierarchy makes decisions and convinces positions higher in organizational hierarchy what should be done.
Collaborative	What is done is determined jointly by a group of people involved with or who have a stake in the project.
Coordinating	A person drives decision-making about a project by coordinating disparate groups or perspectives.
Technical	Decision-making is focused on technical drivers.
Strategic	Decision-making is focused on business processes and organizational drivers.
Persuasive	A person drives decision-making by persuading others to share his/her viewpoint.

Table 6. ***Theoretical Propositions for CIO Disposition***

CIO Perception	Proposition Definition
Challenge	Activities or situations that are identified as making effort more difficult or creating risk for projects.
Opportunity	Activities or situations that are identified as enabling improved approaches, easier effort, or new projects that could benefit the organization.

Interviews were analyzed first by identifying how CIOs described their role and the role of the IT Division and matched to the respective theoretical propositions. The descriptions of project implementation were divided into discrete incidents, which were then analyzed against the theoretical propositions. If the results that emerged from incident analysis did not appear to fit the theoretical propositions, then the propositions were adjusted to be a more consistent representation of CIO statements. Additional interview data was analyzed following a process of meaning coding (Kvale & Brinkmann, 2009), since the domain of investigation was relatively limited and the questions fairly directed. The theoretical proposals used for pattern matching in the case studies provided an initial coding framework. It was critical during probing questions that responses not clearly fitting one of the categories were clarified or expanded to provide more accurate and richer analysis. In addition to applying the existing broad categories from the theoretical proposals, interviews were reviewed to develop unanticipated themes or categories and then coded accordingly. After analysis, an interview summary was developed for each case, identifying the aspects of the proposition framework that interviewees most frequently emphasized. This summary was sent to each respondent with a request to review and provide any additions or corrections in order to increase the validity of analysis(Colaizzi, 1978), and any modifications by the interviewee were incorporated into the data and analysis.

Institutional home pages and IT division websites were analyzed using pattern coding (Miles & Huberman, 1994). Again, theoretical proposals used for pattern matching provided the initial coding framework, and documents were reviewed to

develop unanticipated themes or categories and then coded accordingly. Here, the theoretical proposals were based on best practices for establishing priority and significance through site and page design (U.S. Department of Health and Human Services, 2010) as well as on textual analysis of the actual content on the site.

The analysis from interviews and web pages was used to generate each case. Following a method of stacking comparable cases (Miles & Huberman, 1994), trends were identified across cases, considered within case groupings and across case groupings. Additional attention was given to looking for differences within case groupings to increase validity and decrease natural information processing biases (Eisenhardt, 1989). I anticipated differences based on the variable of the CIO's presence for all three research questions relating to the role of the CIO, role of the IT division, and impact on technology initiatives, but commonalities across this variable were equally telling.

Threats to Validity

One of the most critical threats to validity that I continually addressed throughout the study was my own position and bias as a researcher. This study focused on the position of a CIO in relationship to the leadership team and the impact this position can have on institutional and technology strategic planning. As an active CIO of a professional school at a research university, I have a personal stake in the answer to this question and a bias toward a given set of answers based on my own experience. In my current and previous positions, I have experienced environments on both sides of the variable and have found being a member of the leadership team to be much more conducive to effective strategic planning and believe that my presence as an IT

professional has benefited overall institutional strategy. To minimize this validity threat, I gathered rich data through multiple interviews and used full transcripts of interviews for the data analysis. Through my interview protocol I have not hidden my position but have worked to create space for participants to focus on what is working well at their institutions, increasing the opportunities for surprising results. Following the principles outlined by Peshkin (2000), I needed to be similarly open about my position throughout the process. Further, the selection of institutions that were implementing strategic IT projects implies that technology has been given some level of strategic importance, regardless of the CIO's position. Although my bias is toward inclusion of the CIO on the president's cabinet, the research questions and protocol focused on what is happening in each context rather than attempting to evaluate which is better. I anticipated the results will not provide such an evaluative judgment but rather would provide a descriptive analysis of how the institutions function in each context.

While my identity as an active CIO created a validity threat, it also added strength to the validity of my analysis. I did not view this data as an outsider looking into a world he or she only partially knows. I shared many of the same types of experiences as the people I interviewed. This gave me the ability to identify trends more easily and to spot opportunities to ask probing questions that would clarify what CIOs were saying. It also helped me build trust with CIOs, which may have contributed to their willingness to speak openly about their perspectives and experiences.

A related validity threat involved getting accurate information from interviewees who may suspect a bias given my position from within technology and who were all

CIOs themselves. Review of website was critical to ensuring that analysis considers more than the perceptions of a group of like-minded individuals. Again, focusing on success within each context helped address not only my potential bias but that of the interview participants as well. The interview protocol asked about benefits and drawbacks of their current situation as well as to project what how they believe projects would function if they were in the opposite situation. In this way participants were encouraged to think beyond a likely initial response that they think being on the leadership team is good and were asked to describe both positive and negative impacts of the current context. Finally, looking for differences within cases groupings, especially with consideration for possible differences between what individuals report and what documents reveal, was critical for increasing internal validity of the study.

Using an interview with an individual as the primary source of information for developing the case study risked having a description of the case that is skewed by that individual's perspective and biases. Applying a second source for each case through the review of web pages provided a means of verifying the depiction provided through interviews. As Yin (2003) argues, the triangulation of multiple sources increases the accuracy of the findings.

Finally, many case study approaches have larger amounts of data for a small number of cases. Although the smaller amounts of data meant less rich exploration of individual cases, the greater number of cases provided a richer set of data for each case grouping. Further, by applying the concept of saturation (Shank, 2006) to determine the final number of cases, this study was better able to identify trends within the case

groupings. Interviews were continued until the basic findings are regularly being repeated. Further, Andersson and Nilsson (1964) found that a reliable and valid set of behavior categories could be developed based on a relatively small amount of data when using the critical incident technique. In their study, the last 215 incidents from a total of 1,847 were analyzed separately and it was determined than the smaller set of incidents included all of the categories developed with the larger set. The small set was broken into 20 smaller units and analyzed one unit at a time to determine how quickly the majority of categories were identified. More than 90% of the possible categories were determined after only 50% of the incidents collected had been analyzed. While different data sets would likely yield different specific percentages, the approach appears to provide high reliability and validity with relatively small amounts of data. This study added the option of expanding the number of interviewees until saturation was achieved, building on the strengths of the critical incident technique to create a full picture of the CIO's experience through these incidents. The Andersson and Nilsson study was of its time and applied a positivist perspective on the qualitative methodology of critical incident technique. This study's approach of looking for redundancy or saturation in the analysis of incidents matches more recent approaches of establishing credibility or trustworthiness (Butterfieldet al., 2005). The fact that additional interviews were not needed to achieve saturation further supports the claim that a small number of incidents can be used to develop a trustworthy analysis.

Limitations

This study intentionally focused on a relatively small number of institutions fitting very specific criteria for size and type. These limiting criteria, while essential for a focused and meaningful study, may also limit the applicability of the findings. For example, the decentralized structure of IT at many large institutions may mean that the presence of a CIO on the leadership team has less impact on the alignment of institutional and technology strategies. Similar studies could be completed to examine the role of the CIO and the leadership team at smaller and larger institutions as well as state and research institutions. Even without direct applicability, the exploration of patterns of behavior of a functional manager related to presence on the leadership team does provide insight that may apply at other sizes and types of institutions as well as in other fields, such as human resources.

The interviews were all held with the CIOs of institutions. Perceptions and observations of non-IT people or of others within IT at the institution could also provide valuable insight into the impact of the CIO and the implementation of important technology projects. The potential populations for such studies are large and varied, including faculty and staff from throughout the institution, additional administrators, and students.

CHAPTER IV

RESULTS

In order to create the cases for this study, I gathered data through a survey, reviewed institutional home pages and IT division websites, and performed interviews with CIOs. In the following chapter, I report the findings from data collection and analysis, starting with a review of the survey results. The remainder of the chapter examines the case group for CIOs who are not on the leadership team (N-CIOS), the case group for CIOs who are on the leadership team (Y-CIOs), and cross-case findings. In each of these sections, I report results following the proposition framework for IT division role, CIO role, and implementation and decision-making approaches. I then consider how these are reflected in the institutional home pages and IT division websites. I identify and explore any trends that are unique to the case group or cross-case comparison. Finally, I look at CIO disposition and perspectives about membership on the leadership team.

CIO Surveys

An initial survey invitation was sent to 450 CIOs who met the sample criteria. Eight days after the initial invitation, a reminder was sent to any CIOs who had not already completed the survey or had not opted out from receiving any future emails. Each invitation resulted in about half of the responses. Sixty respondents began the survey, one of whom did not agree to participate in the study after reviewing the study consent

information and one of whom indicated he or she was not the most senior IT person at the institution. Fifty-one respondents fully completed the survey for a response rate of 11.3%, and 35 of these respondents indicated willingness to participate in a follow up interview.

In addition to questions related to the administration of the study, respondents were asked three main questions: (a) “Are you a member of your institution’s leadership team (i.e. President’s Cabinet, Executive Team, etc.)”; (b) “The three most important roles of my position are: (Select up to three responses)”; and (c) “What are the two most important IT projects implemented or in progress on campus in the past year?” These questions were designed to inform the follow up interviews but also to provide data potentially useful for analysis independent from the interviews. Eighteen respondents (35%) indicated they were a member of the institution’s leadership team. Selecting from a list of pre-identified roles, CIOs most frequently selected “Develop IT strategy at my institution” (44 responses, 86%), “Manage IT services” (33 responses, 65%), “Participate in overall institutional strategic planning” (21 responses, 41%), and “Promote innovation through technology” (17 responses, 33%) as the most important roles for the CIO position. See Table 7 for the most important CIO roles as identified by all respondents.

CIOs who indicated they are not on the leadership team most frequently selected “Develop IT strategy at my institution” (27 responses, 82%) and “Manage IT services” (23 responses, 70%). “Participate in overall institutional planning” (10 responses, 30%) and “Promote innovate through technology” (10 responses, 30%) were again the third and fourth most frequently select options, but “Manage information technology

systems”(9 responses, 27%) and “Advocate for technology solutions” (7 responses, 21%) also received a similarly number of responses. See Table 8 for the most important CIO roles as identified by respondents not on the leadership team.

Table 7. ***Most Important CIO Roles as Identified by All Respondents***

#	Answer		Responses	%
1	Develop IT strategy at my institution		44	86%
2	Manage IT services		33	65%
3	Develop new information systems		2	4%
4	Advocate for technology solutions		10	20%
5	Participate in overall institutional strategic planning		21	41%
6	Ensure IT security		7	14%
7	Manage information technology systems		11	22%
8	Oversee IT contracts with external vendors		1	2%
9	Promote innovation through technology		17	33%
10	Develop information policies		7	14%

Table 8. ***Most Important CIO Roles as Identified by Respondents Not on the Leadership Team***

#	Answer		Responses	%
1	Develop IT strategy at my institution		27	82%
2	Manage IT services		23	70%
3	Develop new information systems		2	6%
4	Advocate for technology solutions		7	21%
5	Participate in overall institutional strategic planning		10	30%
6	Ensure IT security		6	18%
7	Manage information technology systems		9	27%
8	Oversee IT contracts with external vendors		1	3%
9	Promote innovation through technology		10	30%
10	Develop information policies		4	12%

CIOs who indicated they were on the leadership team most frequently selected "Develop IT strategy at my institution" (17 responses, 94%), but the second most frequent response was different than overall results as well as the results from CIOs not on the leadership team. "Participate in overall institutional strategic planning" (11 responses, 61%) received the second most responses, while "Manage IT services" (10

responses, 56%) and “Promote innovation through technology” (7 responses, 39%). Remaining responses were less evenly spread for these respondents, with not more than three identifying any of the remaining options. See Table 9 for the most important CIO roles as identified by respondents on the leadership team.

Table 9. ***Most Important CIO Roles as Identified by Respondents on the Leadership Team***

#	Answer		Responses	%
1	Develop IT strategy at my institution		17	94%
2	Manage IT services		10	56%
3	Develop new information systems		0	0%
4	Advocate for technology solutions		3	17%
5	Participate in overall institutional strategic planning		11	61%
6	Ensure IT security		1	6%
7	Manage information technology systems		2	11%
8	Oversee IT contracts with external vendors		0	0%
9	Promote innovation through technology		7	39%
10	Develop information policies		3	17%

Respondents identified a variety of types of projects as the most important IT projects implemented at their institution. The most frequent responses were for implementing or upgrading Enterprise Resource Planning (ERP) systems, making infrastructure upgrades, migrating to voice over internet protocol (VoIP) phone systems, and implementing or upgrading web content or course management systems. No patterns were evident in types of projects identified relative to presence on the leadership team or to responses about the most important CIO roles.

Case Group: CIOs Not on the Leadership Team

General Profile

CIOs who are not on the leadership team (N-CIOs) reported a range of titles and reporting lines. Most indicated a director title, while one carried the explicit title of Chief Information Officer. Most indicated report to the most senior academic officer, which was either a Provost or a Vice President for Academic Affairs, depending on the model of the institution. Some institutions have recently changed to or from a Provost model, but that change did not affect the reporting lines for the N-CIO. Regardless of the title or function, all of the direct supervisors of N-CIOs were members of the leadership team. All N-CIOs reported a significant amount of professional experience, but the amount of time at the institution varied significantly from as few as three years to over 17. The path to get the N-CIO position varied widely from technical to instructional to library responsibilities prior to the technology leadership position. One person reported having been on the leadership team for a time but then removed upon the arrival of a new president who wanted a different administrative structure. Another person was recently

invited to sit in on most leadership team meetings but was not considered a full member of the team.

IT Division Role

N-CIOs reported remarkable consistency for the role of the IT Division, with every N-CIO describing functions and incidents most frequently as either Functional Support or Operations Improvement. Two N-CIOs referenced Innovation and One N-CIO referenced Strategic Partnership, but in each case, they more frequently talked about the division role as being about support and improvement (see Table 10).

Table 10. ***Most Frequently Described IT Division Role by N-CIOs***

	Functional Support	**Operations Improvement**	**Innovation**	**Strategic Partnership**
N1	x	x		
N2	x	x		
N3	x	x		
N4	x	x		
N5	x	x		
N6	x	x		

The N-CIO's descriptions of IT division roles aligned very closely with the proposition framework definition Functional Support where the IT division provides technology development and support to help faculty, staff, and students do their work.

When asked directly about the role of the IT Division, N-CIOs focused on functional support as the core and sometimes entirety of their responses:

> [The purpose of the IT Division is] to support teaching and learning with technological tools . . . to increase the administrative efficiency of all the departments, you know, faculty and staff and how they are doing that and then the third one is just to keep existing systems running smooth and efficiently and risk free. (N2)
>
> We're the go to people when it comes to anything that relates to technology. (N4) Fundamentally what we're trying to do is provide the underlying services for the college. (N5)
>
> We're a service department. We are here to make sure that our students foremost and our faculty have the technology tools that enable them to provide an education for students. (N6)

Support and service were key words describing IT divisions, one or both of which appeared in all N-CIOs statements about the division role. When asked about their own role, most N-CIOs talked about the services of the IT division, and used similar descriptions centered around Functional Support: "My role and main responsibilities are to put together the technical infrastructure of the college and that is probably best described by mentioning the groups who report to me" (N3).

Although not typically included in the direct response to the question about the IT Division's role, Operations Improvement—where the IT division identifies and provides technology solutions that help the faculty, staff, and students do their work better—was referenced as frequently as Functional Support when describing IT projects and services. Several N-CIOs talked about how their work would improve business operations:

> The Banner project . . . impacts so many areas and it has so much potential . . . to really improve how we do things, improve customer service, make our service, our business processes more automated, more self service online consulting . . . it is giving us capabilities we don't have right now in terms of collecting data and making it readily available to folks" (N1)

> We have added modules that will increase our integration and access to data which should make certain processes much easier like the connection between financial aid and accounts receivables—things like that—HR and payrolls, those kinds of changes, while they are big changes for those groups, they should result in significant efficiencies. (N4)

This is consistent with the high number of institutions that are upgrading or changing Enterprise Resource Planning (ERP) projects, which often requires institutions to significantly change their business workflow. One N-CIO indicated explicitly encouraging IT division staff to help people identify better ways to do their work:

> There are a number of those kinds of things that you know we're trying, you know as our people are working with users, they're looking at things that people are doing, you know, and we encourage them to . . . ask questions and make sure that either if you see something . . . ask the question. Is there some way we can do this for you or certainly as we're going through this business analysis now if the question would say, you know what are you doing that's repetitive that computers should be able to do for you? (N5)

In each of these cases, the IT division is using their role to actively investigate and improve how work is done in other units. The implementation of technical solutions is the reason for the IT division involvement, but the descriptions from N-CIOs suggest that the implementation of technology involves the possibility for overall improvement of processes.

CIO Role

Statements that matched the role of Strategist were made by all N-CIOs, and all but one N-CIO made statements matching Educator, Manager, and Facilitator. Only the Technologist role did not get mentioned by most N-CIOs, which only one person making statements matching this role. Although statements matching most of the roles were made by most N-CIOs, the roles of Educator and Manager were mentioned most frequently. Strategist and Implementer were each included in the top two most frequently emphasized roles for two N-CIOs (see Table 11).

Table 11. ***Most Frequently Described CIO Role by N-CIOs***

	Technologist	**Strategist**	**Facilitator**	**Educator**	**Manager**	**Implementer**
N1			x	x		
N2		x				x
N3				x		x
N4		x			x	
N5				x	x	
N6				x	x	

The most frequently emphasized role, Educator, included a focus on helping people better understand technology, including opportunities, implementation, and costs. The people N-CIOs were helping better understand technology included end users of technology, the campus community, and leadership. An N-CIO who had been at her institution for 14 years described the Education role with end users as being part of how they implement technology solutions:

> We don't just shut the door and say here is the new way that you're going to do it no matter what. So, that's a challenge always, it's being, you know, patient and teaching people and then, you know, having them in the new system. And they start to tell other people and they almost have to see the advantages of it before they'll move to that new behavior. (N6)

Providing the Education role for the campus community frequently involved a leadership role on campus committees, as N3 exemplifies: "I lead our information resources council which is essentially the academic information resource team. I've also started the thing they called "tech forums" which are pretty much open in meetings about what we're doing" (N3). Several of the N-CIOs referenced similar roles on campus committees, often in relation to implementation of specific projects. One N-CIO also referenced the need for an Education role for leadership, particularly the president:

> I think he's just developed a respect for us you know . . . when there had been things that we have disagreed, have a couple things were he's made a decision that we had recommended against and you know, it's one of those things that we, I'm not sure if it's fortunately or unfortunately, we were proved right. (N5)

In this case, Education is more than just stating an informed opinion but is part of an ongoing relationship where the N-CIO builds credibility over time by demonstrating the validity of his opinions with the president. This type of education over time appeared with several N-CIOs for all audiences.

The CIO role of Manager refers to a focus on providing oversight for a team of people who provide technology development and support. N-CIOs who emphasized this role were speaking about ways they managed their people. While sometimes explicitly stated when describing their role, it also appeared when talking about how they guided

and supported members of their team, from managing professional development to the ways in which they perform their jobs:

> So you know I've got my head of the web and the person who's the project manager for the administrative systems upgrade started out as a music teacher in high school. My administrative systems manager started out as an entry clerk here. Another in user services was our secretary. And again it's been in each of these cases it's been you know 10 or 15 years of growth but it's you know, but there's hope. (N5)

> I think that one of my personal goals for my division is that we become more pro-active and less reactive but we; I think we do react well to people's request and needs and problems and I think that people would certainly acknowledge that we do that. (N4)

In all of these instances, N-CIOs were clearly emphasizing a managerial relationship they have with members of their teams.

Although all N-CIOs made comments that matched the Strategist role, two emphasized the role frequently enough to be considered one of their top two CIO role emphases. The Strategist role was expressed by N-CIOs as both formal and informal, with the formal role relating to a regular function performed with a committee or group of people: "I advocate for technology with the senior administration and in theory, help to—help them to consider technology as they are setting the strategic direction for the college" (N4). The informal role, which was mentioned more frequently by N-CIOs, reflects instances where the N-CIO made strategic decisions about projects or implementation, often based on his or her evaluation of likely results or prediction of common future practices:

> And so [Google] was the project I feel really good about having pulled that off. Everybody is happy with it now, nobody even questions it now, but it was very scary for these stakeholders for a number of years even though one of the reasons I feel good about it is because I saw clearly years ago that we were going to be here. (N2)

It is worth noting that one of the reasons N2 mentioned the Strategist role frequently was that he and the institution president were at odds about what the institution's strategy should be. His emphasis of the Strategist role may be more a reflection of a part of his overall role where he is experiencing frustration rather than a suggestion that the role is more important than others. Regardless, the frequency does suggest that at this point in time, that role is occupying a significant amount of his attention.

Two N-CIOs also emphasized the Implementer role frequently, which refers to a focus on ensuring technology development and support projects are completed successfully. For most N-CIOs, this emphasis appeared when they talked about providing project management for technology efforts, as exemplified by N3:

> The necessity of figuring out how long is this going to take . . . Putting in a judicious amount of slack and then getting the message to the campus community usually written by me that here's what's going to happen and although we expect to have it done sooner, we don't expect to be running until 8 o'clock tomorrow morning.

The two N-CIOs who emphasized the Implementer role most frequently spent more time talking about how they acted as project lead or project manager, but project management as the way of providing the Implementer role was common across N-CIOs, especially for larger projects.

Implementation and Decision-Making Approaches

Collaborative, Technical, and Persuasive were the only implementation and decision-making approaches to have matching statements from five or six of the N-CIOs. Not surprisingly, they are also the only approaches that were emphasized first or second most frequently. Collaborative was the most frequently referenced approach for all but two N-CIOs and was first or second most frequently emphasized by all but one. Technical was first or second most frequently emphasized by four N-CIOs while three N-CIOs emphasized Persuasive approaches first or second most frequently (see Table 12).

Table 12. ***Most Frequently Described Implementation Approach by N-CIOs***

	Top-Down	Bottom-Up	Collaborative	Coordinating	Technical	Strategic	Persuasive
N1			x		x		
N2			x				x
N3			x				x
N4			x		x		
N5					x		x
N6			x		x		

Collaborative approaches were not only referenced most frequency but also with the strongest and clearest statements about how they were used. The Collaborative approach includes instances when what is done is determined jointly by a group of people involved with or who have a stake in the project. In some instances, this involved bringing in someone from outside the IT division to actively work on the project, as

described by N1, who asked someone from the library to play a critical role in the project:

> I got an additional trainer involved outside of the IT organization. In the library, there is someone that basically is very good at this because he created the library tab in CatLink . . . and I've asked him to get involved to help maybe more with some of the academic folks and he has agreed to do that.

N4 brought in numerous people from other divisions and even had the project manager come from outside IT:

> I think what has gone well is that we've had a really good representative implementation team and a variety of other teams related to the project that have included people from across the campus. So, again we're reinforcing the fact that the ownership of the system is not . . . that IT doesn't own the whole thing. That it is owned by the entire campus and so everybody has a responsibility to make it work.

While not conventional, she attributed much of the success of this project to this combination of representation and ownership coming from outside the IT division despite her team having a central role in the project. N2 emphasized the need to get buy-in from across the campus community by trying their ideas and recommendations even when he did not think they would work: "I spent two years spending resources and a lot of time on experiments and focus groups and different things that I personally thought will never work." N6, on the other hand, incorporated collaboration into her formal strategic planning process: "we have an IT strategic plan . . . that was created through a process with a lot of people involved from across the university." In all of these cases, N-CIOs

described ways in which they reached out to people outside the IT division to help work on and make decisions about the technology efforts and projects they work on.

The Technical approach refers to when decision-making is focused on technical drivers. In some cases, the focus on technical drivers is part of a plan, such as a lifecycle plan for replacing computers or other hardware:

> We just made that decision because we knew that there were some switches and things that were at end of life and the network had grown as they tend to do. They had is it grown bit by bit over the years and so, we realized that as we were replacing switches, we really needed to have a plan to standardized what we were doing. (N4)

More frequently, N-CIOs referenced decisions being made because of external factors that were not planned. In some cases, even when the need for a decision was known, the institutions waited for changes in technology to make them act rather than incorporating it into part of a strategic planning process:

> [The emergency notification system] got delayed, and the new president didn't really say yay or nay. It just sort of went into this limbo, and then finally our insurance company told us we had to have one of these systems. (N1)

N5 described a situation where the Enterprise Resource Planning (ERP) system was no longer going to be supported by the vendor (a situation mentioned by several N-CIOs):

> So we got to a point on that where one of the products that we're using is going to go out of support in the next year, so till the price dropped by about 75% and three of the companies seemed to have stabilized and the products looked pretty good at this point. So it seemed definitely cheaper to stay with them than to go on to a different vendor. So we figured that if we're going to do it we're going ahead and do with the you know, most affordable way and if we're going to spend

> money we'll spend it on the business side of the consulting which is what we're doing and bringing the folks to work with all the officers.

Although the need for a decision was driven by changes in the technology, they were able to use the opportunity to apply other decision-making criteria based on budget and process. Similarly, many of what the N-CIOs described involved technology as a key driver for decision-making but not necessarily the sole driver.

N-CIOs who made statements matching Persuasive approach to implementation and decision-making were focusing on situations where a person, usually the N-CIO, drives decision-making by persuading others to share his or her viewpoint. In some cases, the N-CIO is persuading others that a project should be done and in others the persuasion is focus on how to do the project. Methods of persuasion varied between N-CIOs. N3 described a process where he simply made a case to a fellow senior administrator:

> And then when the deadline really came home, I finally went to another senior administrator and said we've got a deadline on this. It has to be done, and I don't have the staff that can do it. You have got to hire somebody and that somebody I wanted had just given his resignation at a former institution, and I said, "Here's your chance to get it," um, ". . . to get him. This is the only chance we're going to have to get this email system done." We hired him that afternoon. (N3)

Making a case to convince others of your viewpoint was what most N-CIOs described when emphasizing the Persuasive approach. The other two N-CIOs who most frequently emphasized Persuasive, however, had other approaches. N5 described a process where he persuaded students of a specific viewpoint with the long term plan of persuading senior administration of the need for the effort:

> And you know we've done a couple of things like that you know where we started billing, you know we wanted to bill for printing. Give them x number of free sheets and then bill for the rest. We've never done that. So we convinced a couple of student senators of the righteousness of it all in exchange for using recycled paper and so it became a student-led initiative that we simply agreed to. But again that one instead of starting with the senior staff, we started with, got a VP behind us and then we went to the students so to let it bubble up from the bottom. (N5)

N2 described an approach of focusing on an aspect of the project or a related technology that was of more interest to stakeholders in order to make decisions that benefited his project implementation goals for a larger project:

> Content management system for our web site. Not everybody knows that we need it. Few people know what it is. The way that I am going to achieve it is going to be through a backdoor from my point of view but from everybody else's point of view it's mobile devices and being able to present corporate information on a mobile device. In order to pull that off, in order to translate my whole web site in to something the works on a small browser, I want a content management system. (N2)

Whichever approach employed, N-CIOs have made regular use of the Persuasive approach to convince others of their viewpoint and make decisions that move projects forward.

Website

All N-CIO institution IT division websites focus on technical support and services for end users. Supporting documents, contact information, and web forms for requesting support are emphasized. One site has information related to strategic planning and another site includes general technology updates that communicate what is happening related to technology on campus. Although this information is available, the focus of these two sites is still on technical support.

Five of the N-CIO institution IT division websites were hard to get to from the home page, meaning no link could be found that would go directly to the page. In each of these cases, the page was found through searching the institution site for "technology," where the IT division website appeared anywhere from the first to seventh listing on the search results—one site did not have a link to the home page through this approach but had several to internal pages within the IT division site.

Three of the N-CIO institution home pages had no references to technology or links to technology or social media resources. Two institutions had some links and one had many. At all three of these institutions, technology links focused on social media tools for students like Facebook, LinkedIn, Twitter, Flickr, YouTube, and RSS. None of the N-CIO institution explicitly referenced technology as a strategically important tool or highlighted technology resources or innovations (see Table 13).

Table 13. ***Technology Links and Resources from N-CIO Institution Home Pages***

	Ease of Getting to IT Site		**Technology Info/Links**		
	Easy	**Hard**	**Many**	**Some**	**None**
N1		x		x	
N2		x			x
N3		x			x
N4		x			x
N5	x			x	
N6		x	x		

CIO Disposition

More often than not, N-CIOs had the tendency to characterize activities and situations as Challenges rather than Opportunities. The frequency with which they described situations as making effort more difficult or creating risk for projects was generally greater than the frequency with which they described situations as enabling improved approaches, easier effort, or new projects that could benefit the organization. Half of the N-CIOs characterized situations as Challenges with greater frequency than Opportunities. Two N-CIOs described Opportunities and Challenges with the same frequency, and one N-CIO described Opportunities with much greater frequency than Challenges (see Table 14).

Table 14. ***Frequency Count of Challenge and Opportunity Language Used by N-CIOs***

	Challenge	**Opportunity**
N1	5	5
N2	9	0
N3	1	9
N4	4	2
N5	9	1
N6	2	2

The Challenges N-CIOs described tended to be specific to their stories. For example, N2 has had significant challenges with the president, as described above. Most of his characterizations of Challenge appear to revolve around that relationship. N1 expressed both challenges and opportunities. Interestingly, these mapped to when she

was not on the leadership team and when she was. N5 characterized many situations as challenges. Unlike N2 and N1, he presented these as resolvable, but the focus was on the challenge:

> You know we had huge problems last fall with the phishing on campus, phishing email. And so we had to you know, change some processes and some security issues with that and so well some people were sort of pissy about it, but you know once they understood the impact you know, a couple of grumbles but nothing too bad.

Many of the challenges he described were similarly related to technical issues, and in each case they appear as obstacles to be overcome rather than barriers that make completing needed tasks impossible. For N4, the focus of most challenges was on getting people to listen and commit to decisions, which has been particularly challenging how something should be implemented or what projects should receive priority. As N4 described, "we do a have steering committee, which is made up mostly of vice presidents, and in theory, they should listen to all of the issues and come down on one side or another—typically though they don't." These challenges are described as a situation she has to deal with, an obstacle she cannot necessarily overcome but must work around or simply accept: "so what we've had to do is more customization than we wanted." N6 described challenges related to managing people's expectations, but his strongest challenges related to staying informed and the importance of working through his supervisor for that role. When asked how he stays informed, he responded, "a lot of it depends on my boss . . . and my, I'm on my ninth boss . . . in 14-15 years." He described a positive relationship with his current supervisor: "my present boss he is, he is excellent.

He is probably going to be the best boss I've had in 14 years which is a real joy." This description parallels the importance other N-CIOs described about the relationship between the CIO and president or supervisor. The one N-CIO who characterized situations most frequently as opportunities, N3, focused on his own role and the importance of communication. He described one challenge, but he remained focused on how he was acting to solve it: "A lot of this is the ability to communicate, to call key people up and say, 'I've got a problem. '" This perspective parallels his description of his relationship with the president, which is described below.

Leadership Team Presence

One N-CIO, N3, did not think it would help to be on the leadership team and felt he had all the support and communication he needed to do an effective job. The remaining five N-CIOs, however, all mentioned the value of being able to hear discussions that may relate to technology. And four of the N-CIOs cited the value of being able to tell the leadership team about technology, either to educate them or to help move projects and ideas forward more effectively and efficiently. N2 believed that membership on the leadership team would enable technology to be "used strategically." Similarly, N6 noted the benefit of being involved in decision-making and prioritization. She also mentioned that the relative value of being a member of the leadership team depended in part on who she was reporting to. She has had significant turnover in her supervisor's role, and found some of those relationships to be very effective while others were challenging. Being on the leadership team would allow her to no longer depend on her supervisor to represent her during the decision-making process. One of the strongest

benefits was articulated by N1, who described the perception created by being on the leadership team:

> When you report to the president and you're sitting on the cabinet, I think people have a different view of the importance of the IT are the strategic possibilities of IT versus, you know, you're just a folks that keep the network going on to fix our computers.

She has found that she is listened to more seriously and experiences fewer obstacles when trying to get things done. It is important to note that N1 has been both on and off the leadership team at the same institution, so her perspective reflects an experience where most of the people involved are the same but her position is not. N5 anticipated that he would be able to bring opportunities more directly to leadership rather than having to work so hard to develop a case: "I think it's cleaner if you can start with the senior staff and say look, this is a major change for the school you know let me try and explain what's going on."

Several N-CIOs expressed that being on the leadership would be time consuming and require them to be less hands-on with projects than they currently are. In addition to anticipating the benefit of being involved in decision-making, N6 envisioned the potential drawback of being a decision-maker without the "cushion" of more people above your role. Similarly, N4 talked about the risk of being on the "front line" with the leadership team when there are technology issues, much like currently happens with some faculty meetings, where she can "leave those meetings pretty beat up." N2 expressed concerns about being "at the whims of the president" and in the end declared he would prefer not to be on the leadership team because his relationship with the president is too contentious

and that “having an IT director on a cabinet with the president requires teamwork with the president.”

Case Group: CIOs on the Leadership Team

General Profile

CIOs who are on the leadership team (Y-CIOs) reported Chief Information Officer, Associate Provost, Executive Director, and Director as titles. Reporting lines were most frequently to the president but also included reporting to the most senior academic officer. All Y-CIOs indicated significant professional experience with a range of time at the institution from three to 15 years. For those who had been at the institution longer, they joined the leadership team three to eight years ago. One Y-CIO who had been at the institution for three years, Y5, joined the leadership team eight months ago. Many of the Y-CIOs have responsibilities in addition to technology. The path to get to the Y-CIO position varied from technology to library to faculty. Half of the Y-CIO institutions had library and technology reporting to the same position, with one institution integrating the groups such that it was not possible to provide a separate number of employees for the IT division.

IT Division Role

All Y-CIOs emphasized Functional Support during the interview, and 5 of the Y-CIOs made statements matching Functional Support first or second most frequently. Operations Improvement was emphasized first or second most frequently by four of the Y-CIOs. Two Y-CIOs emphasized Innovation most frequently, while only one referenced Strategic Partner at all (see Table 15).

Table 15. ***Most Frequently Described IT Division Role by Y-CIOs***

	Functional Support	Operations Improvement	Innovation	Strategic Partner
Y1	x		x	
Y2	x			x
Y3	x	x		
Y4	x	x		
Y5	x	x		
Y6		x	x	

Functional Support for Y-CIOs involves providing the technology support and tools needed for faculty, staff, and students to do their work. While the functional areas of emphasis had minor variation, the basic idea of a foundation of support was consistent across Y-CIO descriptions:

> I am responsible for everything that plugs in and blinks. (Y1)
>
> If it had buttons, we'd deal with it . . . we cover everything from . . . networks, servers, uh, desktops, things like that, all the way to wiring card swipes, um, phone systems, and we run a pretty thorough help desk . . . we cover every technology role on campus. There's nothing that we don't oversee in some way. (Y5)
>
> [IT] really is a foundation. It's one of those foundations of service and support that cut across the entire community here. Anything involving computers, technology on the academic side, on the administrative side, on the service side. These are the men and women that provide that service. (Y4)

The role of the IT division was described in direct response to a question about the role but was also apparent in descriptions of the CIO's role and of projects worked on by the

IT division. Support was a common word that appeared in most descriptions as was the sense that the support need cut across the entire institution.

Y-CIOs did not typically reference Operations Improvement when specifically describing the function of the IT division, but it was a common theme when describing projects completed by the division. For some, the goal of the projects being completed included elements of helping faculty, staff, and students do their work better:

> Mainly what I've done in the last four years or so has been to upgrade most of the campus technology. Uhm, we did a major—we completely swiped out all the network switches on campus in December of '08 and we have—we uhm, we've upgraded all of the wireless hubs on campus. We've changed all of the campus computer labs to do dual-boot Macs so that people can work either on a Mac side or on the Windows side. Uhm, we have a faculty laptop program where every three years, faculty get a new laptop and we're just implementing a staff replacement cycle. In the past, staff who complained got new computers and staff who were polite just gets their old computer until they finally said 'I can't do my work anymore. 'We're upgrading that. We have privacy policies and security policies that are being put in place. Uhm, we have uh, we, we had horrible physical protection for our network servers, and now all of our network servers have physical protection around them that it keeps them from being tampered with as well as software protection that hopefully keeps us at least some, from the attacks at the college. (Y6)

In each project on Y6's list, she mentioned changes that provide new features, new equipment, or greater reliability. She described these projects not just as replacements for systems that had reached end of life but as improvements, "upgrades." Another type of emphasis was exemplified by Y3, when he described the people involved rather than the projects:

> A recognition of the value that they see and getting some of the things that ah . . . um . . . you know suddenly the light bulbs sometimes comes on it says, oh, yeah

> we could gather that information and that might help us do our work better or do our . . . or we'll have to do a little more efficiently so. (Y3)

Operations Improvement through technology involved more than just new and better tools but could also be about ways technology can improve processes and workflow systems. This was particularly apparent in places where the IT division was involved in upgrading and Enterprise Resource Planning (ERP) system, as was the case for Y3, but the comments from Y-CIOs that referenced Operations Improvement did not appear restricted to work on these large administrative systems.

The IT division function of Innovation can be seen when technology solutions that help the institution provide new approaches to achieving its mission or be considered by peers as an innovative institution. Y-CIOs who emphasized Innovation were clearly reflecting an institutional priority. For Y6, she described her approaches to working with vendors in ways that might help the institution reclaim its status as a strong technology campus:

> For a brief time we had great notoriety [as one of the nation's most wired campuses] and the board I think wanted to start recapturing some of that. So, part of my role—part of my uh, operating procedures has been to collaborate with our vendors to build case studies that showcase the college, showcase the vendor and give us both something that we can take out and say "See, here's what we're doing that's exciting." I take it to my board, they take it to their customers, and works very well. It's a win-win for both of us.

Although she is describing her role in working with vendors to emphasize innovation on campus, the collaboration she is highlighting is between the vendor and the IT division.

Y1 described a similar role for the IT division, suggesting that innovation has been and will continue to be an important expectation of technology support at the institution:

> We always try to be progressive and we have for the iPad. So we really like to go out there and identify what's going on, keep up with things, and feel like we're not being left behind in any way, shape or form. And so, we're always trying everything new out and we have some faculty that are curious enough to go ahead and do some of these projects. So, we identified this as kind of a logical next stop to some of the stuffs we are doing with iTunes U.

In both of these cases innovation through technology is described clearly as an expectation not just of the Y-CIO but of the institution's leadership in general.

CIO Role

Y-CIOs emphasized Strategist, Manager, and Implementer CIO roles more frequently than any other roles. The emphasis of the top three roles was equal across Y-CIOs, with two emphasizing each possible combination most frequently. Four Y-CIOs made statements that matched the Educator role, but each of these emphasized other roles more frequently (see Table 16).

Table 16. ***Most Frequently Described CIO Role by Y-CIOs***

	Technologist	Strategist	Facilitator	Educator	Manager	Implementer
Y1		x				x
Y2		x			x	
Y3					x	x
Y4		x				x
Y5					x	x
Y6		x			x	

The Strategist role was defined as a focus on how efforts and projects fit within the larger organization, considering long term operations management and achievement of mission. One Y-CIO described the ideal CIO in remarkably similar terms, emphasizing the importance of thinking about the institution as a whole rather than specific projects:

> I do believe that CIOs, whatever your title is, need to get a grasp of the big picture if they haven't already gotten it . . . They need to stop thinking about when I used to be a programmer and think more about what is it that IT does for this whole place. (Y1)

Y4 talked not just about what the CIO should focus on but about the consequences of the necessary and appropriate larger focus for the CIO: "CIOs have a tendency to know their institution probably as well as nearly anyone because of their broad swath that we really cut across the institution." What is telling about Y4's comment is not just that it reflects his own experience at his current and previous institutions but that he assumes this is true for most CIOs. Y2 takes the Strategist role a step further in her work not just across the institution but with a consortium of five institutions:

> So we are thinking about does it make sense to have a single learning management system across five institutions to better support the faculty and students who travel between campuses, there is a lot of cross campus fertilization joining. We are implementing Shibboleth, which is a Federated Identity Management System that will, sort of a foundational building block for a lot of other IT collaborations.

As a Y-CIO, she is planning strategically not just for the benefit of her own institution but in collaboration with and benefit for the consortium of institutions. Even in the details of this collaborative work, they are thinking strategically, determining and implementing

building blocks like identity management, which might not be noticed initially at any of the institutions, in order to establish the foundation for approaches and tools that would be more visible and significant collaborations for the institutions and their students, faculty, and staff.

Y-CIOs described the Manager role in one of two ways: a) a focus on the individuals within a team and b) a focus on the team as a whole. In both cases, the Y-CIO is providing oversight for a team of people who provide technology development and support, but the needs for management varied. Y2 described how she was building a team of individuals and skills that would provide clearer services for faculty: "so we are creating sort of common levels of skills and a common understanding of what's expected." She explained that her approach was designed to allow a varied group of people with reference librarian backgrounds and instruction technology backgrounds to work in similar roles to offer a more proactive support service for faculty. She is simultaneously working to implement new services and to improve the quality and consistency of services by focusing on the training and professional development of the people in those roles. Y3 offered another approach to professional development, using the success of one team member to help train other team members:

> One of the things I'm—I'm going to um . . . ask the guy who was the lead on the project to actually do some project management training for the rest of the staff . . . I'm going to ask this guy to kind of head up a project management . . . tutorial or a series of . . . workshops for the rest of the staff.

He described project management skills as one of the most significant skill deficits across the team and will offer internal training in order to provide a model and share expertise.

The second focus for Y-CIOs emphasizing the Manager role was on the team as a whole, in particularly on establishing a structure for the team that matched the service and support efforts expected of the team:

> Well, we for example, we were a Novell shop for many years. And, we relied on external consultants to deal with Novell because, frankly, we didn't have the skills on staff to deal with it. And, so as we looked to transition away from Novell and go to other, you know, systems, other back end platforms, we made choices based on, you know, I mean we went with back up directory and Windows based storage and Unix, some Unix based file systems. Um, but skills on staff. Had we not, I would have hired them. There were many situations with some of those older platforms that it was cumbersome and frustrating to have to rely on a vendor to help us with day to day operations. (Y5)

Y5 described how he is balancing between in-house skills and vendors. He is not looking just to train staff to provide specific services but will sometimes make technology decisions based on the skills of the staff—rather than continue supporting Novell products, he moved the campus to Windows and Unix systems that were a better match for the skills of his team. At the same time, he suggested a willingness to make staffing decisions based on the desired technologies. Part of the balancing exemplified in the Management role was not just about the projects and team members. Y6 also talked about adjusting the structures and skill sets of her team:

> I've been building up my staff so that I can have uhm, I have two directors and I will now have three who report to me, and I give them responsibility for the day-to-day work and technology and I review, I coordinate with them, I support them where they need to. But they're very capable, so I will be not so much involved in day-to-day functioning of technology but I will be doing the uhm, the long-term planning and the review of policy and the review of uhm, of assessment, things like these.

In this case, she was focused not just on making sure technology projects could be implemented effectively but also on creating time that would enable her to focus on other roles, which in her case was primarily Strategist but also included Educator, Facilitator, and Implementer.

When a Y-CIO emphasized the Implementer role, he or she was typically describing a role played on specific technology projects. Ensuring technology development and support projects are completed successfully meant providing project management, coordination, and leadership roles for the project. No Y-CIO suggested that he or she served an Implementer role on all projects, but certain projects were defined as important enough to warrant direct involvement. For some, the scope or size of the project was the cause of their involvement. Y5 described progress on one of his campuses larger projects:

> We've identified what we want to do in terms of there were several choices for VoIP that we shopped around with. We have made a choice on a system . . . And, so we're ready now, and now it is essentially a planning of the timeline of work and when to start that and how that will overlap other things that we'll be doing.

For Y1, it was not just size that caused her to be involved but also who was involved in the project:

> If it's a huge project were we do work kind of in a matrix situation . . . then we pull people, whoever it is that we need the expertise, you know, our experts and I may run that project. . . . And I may hold meetings so we just come together and talk about the project and what we're going to do and what we need to accomplish and how much money and what kind of politics I need to take care of.

The Y-CIO in this case becomes involved when coordination is required across groups rather than just within the IT division. Sometimes the involvement of the Y-CIO is due not to who is on the project team but who is interested in the project. Y4 described a project that had the attention of the institution's board members:

> I actually provided a monthly stop light report along or I would say maybe 12 categories . . . Time, money, um, I don't remember all the categories . . . so he [board member] walked with us through this entire implementation . . . When we finished this implementation, the Board of Regents wrote a resolution, if you will, recognizing this team for the work that they did.

As this last example illustrated, one of the key Y-CIO functions in the Implementer role was to facilitate communication, whether across the project teams or to stakeholders not directly involved in implementation.

Implementation and Decision-Making Approaches

All Y-CIOs made statements matching Strategic and Persuasive approaches, and five made statements matching Collaborative. The most frequently mentioned approaches by Y-CIOs were Strategic and Collaborative, emphasized first and second most frequently by four and five Y-CIOs respectively. Although all Y-CIOs referenced Persuasive approaches, only one emphasized Persuasive first or second most frequently (see Table 17).

Table 17. ***Most Frequently Described Implementation Approach by Y-CIOs***

	Top-Down	Bottom-Up	Collaborative	Coordinating	Technical	Strategic	Persuasive
Y1			x			x	
Y2			x			x	
Y3			x			x	
Y4			x				x
Y5		x			x		
Y6			x			x	

The Collaborative implementation approach was a key tool described by most of the Y-CIOs. In many cases the means of making joint decisions by multiple stakeholders was achieved through formal committees, whose purpose was to ensure collaboration in both prioritization of what projects were undertaken as well as in how projects were completed. Y6 described an extensive process that shared many elements with what other Y-CIOs mentioned:

> We have a committee—a campus-wide committee . . . And I chair that committee that has appointed rep—a representative that's appointed by each unit—one from student affairs, one from each of the academic schools, one from the business office, one from uh institutional advancement, one from the uh, admissions. And each of these reps comes to the monthly meetings and we talk about what the proposed projects are. I will bring in, and, and some of the other information services staff will bring in information about our projects and then uhm, we take our budget and we take requests from all of the units. The units send the requests to the representatives. The representatives fill out budget request, and then we have a series of extensive meetings where we, as a small group, go through the budget request and behind closed doors, rank the relative merits of each request based on how they feed into or don't feed into the college's strategic goals.

While not all Y-CIOs engaged a committee in as many stages as done by Y6, this focus on a representative committee that informed project decisions was a common approach. In addition, some Y-CIOs talked about informal expectations, particularly of their own team members: “We’ll work very collaboratively. And they have managers that worked for them, sometimes they get everyone in the room, depends on what project it is, which one of them will take the lead and it will be in their area” (Y1). Y4 extended the expectation of collaboration even further, suggesting that all technology projects are collaborations with people outside the IT division, who are the ultimate “owners” of the projects:

> Well, we believe that—I believe, I’ll personalize it—that functional users have to own these systems. And one thing we did, we, in essence, distributed our system analyst out to those functional areas. So the functional areas set priorities for technical work. We coordinate that. We have a directive enterprise sys admin who has to coordinate that, but, by and large, the priorities are set by the customer, if you will, and that has helped a lot.

Although Y4 was the only Y-CIO to state the expectation so clearly and directly, this philosophy of other’s in the institution as being the most important stakeholders for technology projects was consistent with characterizations of other Y-CIOs.

The Strategic implementation approach paralleled the emphasis of the Strategist CIO role, with three of the four Y-CIOs who emphasized the Strategist role also emphasizing the Strategic implementation approach. Much like the CIO role, Y-CIOs talked about the Strategic approach in terms of having a larger vision of the institution in order to focus on business processes and organizational drivers. For several Y-CIOs, this was accomplished through formal mechanisms:

> I usually sit down with my team and review all the various things and we work against a strategic plan . . . And right now I have kind of vanilla strategic plan that we are working against, based on what we see as the future, what we know are our needs. Waiting for the president to—we have a brand new president—waiting for the president to come out with his vision and start to write the college's new strategic plan so that I can then align our strategic plan with that. (Y1)

> We do have a five-year plan that we have pretty much reached . . . come close to reaching the end of it and we need to engage in another strategic planning initiative um . . . and certainly the network and virtualization was part of our last plan. (Y3)

For these Y-CIOs, strategic planning had an active presence prioritizing projects, with decisions being tested against technology and institutional strategic plans. In addition, some Y-CIOs emphasized the importance of thinking beyond the specific project and making decisions about how a project was done with a consideration for how that decision will impact other parts of the institution: "It can't be done without thinking about—decisions can't be made without thinking about their impact on academic affairs, and they have been in the past" (Y6). Much like the Collaborative approaches, Y-CIOs have thus developed both formal and informal ways of ensuring Strategic implementation approaches.

Although emphasized by only one Y-CIO, the Persuasive implementation approach, where a person drives decision-making by persuading others to share his or her viewpoint, did match at least one statement made by all Y-CIOs. In most of these cases, the Y-CIO described an instance where he or she argued for, and usually achieved, a specific result from others in the organization:

> The consultant made a proposal. I reformatted that proposal into a presentation for the cabinet and we had a couple of options including doing continuing to do what

> we were doing. And they agreed with my recommendation and we moved to that system. (Y4)

In this example, Y4 was persuading the leadership team, which was most frequently the focus, since they were often the final decision-makers.

Website

All Y-CIO institution IT division websites focus on technical support and services for end users. Supporting documents, contact information, and web forms for requesting support are emphasized, and one site even has the ability to check for open space in computer labs. One site has links annual reports and the IT Strategic plan, but the focus of the site is still on technical support.

Three of the Y-CIO institution IT division websites were easy to get to from the home page, meaning a link from the home page went directly to the IT division website, and one home page even had multiple links pointing to the IT division. For two of the sites that were hard to get, the page was found through searching the institution site for "technology," where the IT division website appeared as the first or third listing on the search results. For one site, searching for "technology" went to a directory page for the IT Division that was not connected to the IT division website, which could be found by going to the Students section of the institution site, where a link to a dedicated website was available.

Five of the Y-CIO institution home pages had references to technology or links to technology or social media resources—four institutions had some links and one had many. At four of these institutions, technology links focused on social media tools for

students like Facebook, LinkedIn, Twitter, Flickr, YouTube, and RSS. One institution had a link to a web portal with resources, technology and otherwise, that would be presented in a ways customized to each individual. The institution that had many links had a video hub and blogs in addition to the typical list of social media tools. One Y-CIO institution home page had no references or links to technology. None of the Y-CIO institution explicitly referenced technology as a strategically important tool (see Table 18).

Table 18. ***Technology Links and Resources from Y-CIO Institution Home Pages***

	Ease of Getting to IT Site		**Technology Info/Links**		
	Easy	**Hard**	**Many**	**Some**	**None**
Y1	x			x	
Y2	x			x	
Y3	x			x	
Y4		x	x		
Y5		x			x
Y6		x		x	

CIO Disposition

All Y-CIOs characterized activities and situations more frequently as opportunities rather than challenges. Half of Y-CIOs did not have any references to situations that make effort more difficult or create risk for projects. For those that did reference challenges, they still more frequently described situations as enabling improved approaches, easier effort, or new projects that could benefit the institution (see Table 19).

Table 19. ***Frequency Count of Challenge and Opportunity Language Used by Y-CIOs***

	Challenge	**Opportunity**
Y1	1	2
Y2	0	4
Y3	1	5
Y4	0	4
Y5	2	3
Y6	0	6

Y-CIO characterizations of Opportunity varied widely depending on the specific circumstances. In some cases, it involved making opportunities out of day-to-day situations. Y3's decision to build on the success of one employee who excelled at project management exemplified this perspective. Rather than focusing on the challenge of needing more project management expertise, "we're kinda gonna use them—their project as a model." Y6 was similarly focused on opportunities in every day work but tended to emphasize a broader perspective the spoke to her role at the institution:

> It's been a matter of having the areas of academic affairs that use a lot of technology by having them report to me than there are economies of scope that are possible for us that are important to the small college.

In this example, she is speaking about her expanding role and not just how it created opportunities for her but how she sees it creating opportunities for the institution. Y4 shared a perspective about himself that appeared to inform a number of his comments:

> I really am a half full person. I tend to want problems above the table. I don't like secrets. I like to solve problems and I firmly believe there's a solution everywhere. I'm very optimistic about things, life in general, and here, I have enormous respect for the people I have worked with over the last, oh my God like 40 years or so, and the success I've had is really their success.

Although not about the institution or projects specifically, Y4's explicit and self-aware declaration of disposition showed through in his description of specific projects as well. Similarly Y2 showed a general tendency toward viewing incidents from a positive perspective, even when they appeared on the surface to put her at a disadvantage. At Y2's institution, the incoming president changed a leadership team of senior staff to two different leadership teams, a president's council and an officer's group, with the latter being the most senior leadership team. When asked how she interpreted the transition from senior staff to president's council, she responded:

> Well, I mean we have, I perceive it very positively. We have got our new president with a different approach and I am happy to be at the table whether it's one role or the other. But I am just happy, I am happy to be at the table so.

Even in the face of what could be interpreted as a lessening of authority or influence, Y2 was focused on the opportunities she experienced and saw.

By contrast, Y5 appeared more influenced by external drivers than the other Y-CIOs, and his characterizations of challenge versus opportunity reflected what was happening around him rather than a consistent disposition. When describing the impact of his former president, his characterization was focused on the challenges created by working with someone he described as not "technology friendly." He reflected on the role he played relative to this president:

> Our former president was probably not a technology friendly person. And so, not only not sitting on the cabinet, but arguing for a or presenting a pitching for a technology project that I'm not sure that he's really gonna see the benefit of or understand what that means was pretty tough.

A new president, however, brought a new perspective, and the characterizations used by Y5 remain focused on external influences but are presented as opportunities: "And then, versus now I'm on the president's cabinet, I report on what's going with technology, and he is a technology friendly president, you know. So that, I would say, makes a big difference." Other references to challenges and opportunities made by Y5 reflected the presence of these two different presidents with what appeared to be significantly different stances toward technology.

Leadership Team Presence

Every Y-CIO talked about the value of hearing and knowing what is happening at the institution and ascribed that as one of the key benefits to being on the leadership team. When considering the hypothetical prospect of not being on the leadership team, Y2 explained:

> I would find it much more difficult to understand the directions and the needs at the highest level and to ferret those out and to help support those . . . I think it would require some sort of development of some sort of shadow process or shadow system to ferret all that out. (Y2)

Y3 talked about the challenges of know what was happening before she was added to the leadership team and how it has enable her to be "the voice that speaks up in the meetings and . . . and so you know if you're gonna do this, you need to consider this."

All Y-CIOs expressed value in being on the leadership team, and none indicated they should not be there. Some Y-CIOs, however, talked about ways they could be or were successful when they were not on the leadership team. Y1 had a dual reporting line to two members of the leadership team before being brought onto the team and actually found that it worked well, but only because of "the quality of the two gentlemen." Those people are no longer there, and she believes it would be much more difficult now. But she also finds that she is now one of the "wolves" at the table competing against two roles that use to be her advocates. Y4 similarly talked about previous successful experience not on the leadership team and again attributed it to quality of people in the organization. And Y5, who was recently added to the leadership team, explained that the role of the president has had a greater impact than being asked to sit on the leadership team, as explored further below.

Roles beyond Technology

Four of the Y-CIOs reported having leadership roles that extended beyond technology. In all four cases, the additional responsibility included the library, and for Y2 and Y3 was exclusively the library. Combining technology and the library appeared to be a common trend at private institutions of this size—one of the N-CIO institutions, N2, combined these roles as well, and a second, N4, had planned to merge IT and the library but reverted to separation upon the arrival of a new provost. The combination of IT and library groups occurred at some Y-CIO institutions more than a decade ago, and in Y3's case preceded being added to the leadership team. At some institutions merging meant that a single person provided oversight for two distinct groups, but at Y2's institution, the

groups were merged into a single group to the extent that she could not provide a count of the number of people who would be considered part of the IT division. Y-CIOs mentioned that the merger of IT and library was a trend that started about 15 years ago and that has grown significantly. Y2 described participation in a group of about 40 institutions with merged IT and libraries and characterized membership in that group as currently on a plateau but generally growing "in fits and starts."

Y4 and Y6 described roles beyond technology and even the library. Y6 was recently named a Dean for a set of academic functions that included the library, registrar's office, institutional research, and instructional design and technology. These responsibilities came with a separate reporting line to the provost. Although she retains the title and responsibilities of CIO, this newer title will soon change to Associate Provost, so she can take on even more responsibilities that had previously been completed by the provost while he works on fundraising. Y4 described a similar path of growing administrative responsibilities. He started as a dedicated CIO, but when the institution moved from a vice president for academic affairs to a provost, he was named as Associate Provost and given the additional responsibility of institutional research. He was also made responsible for the Office of the Registrar, although he was relieved of that responsibility so that he could serve as Interim Dean of Students. In talking about how he received these responsibilities, he pointed out the broad knowledge of the institution the CIO has and that even for the Dean of Students role, "I knew those services well."

Cross-Case Findings

IT Division Role

Both N-CIOs and Y-CIOs placed more emphasis on the IT division roles of Functional Support and Operations Improvement. One Y-CIO emphasized Innovation rather than Functional Support, and two Y-CIOs emphasized Innovation or Strategic Partner rather than Operations Improvement (see Table 20).

Table 20. ***Comparison of IT Division Roles between N-CIOs and Y-CIOs***

	Functional Support	**Operations Improvement**	**Innovation**	**Strategic Partner**
N-CIO	6	6	0	0
Y-CIO	5	4	2	1

The ways in which N-CIOs and Y-CIOs described Functional Support and Operations Improvement were similar. Both groups frequently mentioned “support” and “service” in both their explicit descriptions of the IT division role and of specific projects. The one Y-CIO who did not emphasize Functional Support, Y6, did describe a similar set of support services but always from the perspective of improvement, suggesting that she assumed a based level of support that she was continually improving upon. In both groups, Operations Improvement was both about making IT services better and also about making other business operations better through technology.

Although no N-CIOs emphasized Innovation as an IT division role, two did make statements that matched Innovation. N2 described Innovation as a potential IT division role but this was in the context of what the president wanted that he did not agree as an

appropriate priority. N4 described an instance of innovation with an iPad initiative, where the IT division made a proposal for a major initiative that was presented to the leadership team and based on their feedback scaled down to a pilot. On the other hand Y1 and Y6 described strong interest from themselves and their leadership for the IT division to serve as a source of innovation for the campus.

CIO Role

Although all Y-CIOs referenced the Educator CIO role, none emphasized it first or second most frequently. By contrast, more N-CIOs emphasized the Educator role most frequently than any other role. The Manager role was emphasized frequently by both Y-CIOs and N-CIOs. Two N-CIOs emphasized Strategist or Implementer most frequently, while four Y-CIOs emphasized the same roles (see Table 21).

Table 21. ***Comparison of CIO Roles between N-CIOs and Y-CIOs***

	Technologist	**Strategist**	**Facilitator**	**Educator**	**Manager**	**Implementer**
N-CIO	0	2	1	4	3	2
Y-CIO	0	4	0	0	4	4

For the Manager role, both N-CIOs and Y-CIOs focused on how the IT division was supervised. This included how team members were trained and what support and guidance was provided to help them succeed in their roles. Y-CIOs, however, also talked about how their groups were structured and how that structure facilitated division success or enabled the Y-CIO to focus on other efforts and roles.

N-CIOs and Y-CIOs described the Strategist and Implementer roles in remarkably similar terms. Strategist included both formal and informal roles, and Implementer focused on providing project management for specific projects of greater scope or size.

Y-CIOs who made statements matching the Educator role were consistent with the areas of focus of N-CIOs, educating end users, the campus community, and leadership. They did not, however, talk about the role frequently nor as one of their more significant roles, and references were more often focused on educating leadership.

Implementation and Decision-making Approaches

Collaborative implementation approaches were emphasized first or second most frequently by the most N-CIOs and Y-CIOs. Four N-CIOs emphasized Technical approaches compared to one Y-CIO. No N-CIOs emphasized Strategic approaches first or second most frequently compared to four Y-CIOs. All N-CIOs and Y-CIOs referenced Persuasive implementation approaches, but three N-CIOs emphasized the Persuasive approach first or second most frequently compared to one Y-CIO (see Table 22).

Table 22. ***Comparison of Implementation Approaches between N-CIOs and Y-CIOs***

	Top-Down	**Bottom-Up**	**Collaborative**	**Coordinating**	**Technical**	**Strategic**	**Persuasive**
N-CIO	0	0	5	0	4	0	3
Y-CIO	0	1	5	0	1	4	1

While both N-CIOs and Y-CIOs emphasized Collaborative implementation approaches more than any other, N-CIOs tended to focus on how collaboration occurred

with specific projects. Y-CIOs, on the other hand, more frequently talked about formal systems that require collaboration and informal expectations that encouraged it.

All N-CIOs and Y-CIOs made statements that matched the Persuasive implementation approach. For N-CIOs, this ranged from making a case directly to another individual to working through others to demonstrate a need to a third party, usually leadership. All of the Y-CIO descriptions involved make a case directly to another individual, again, usually to leadership.

Like many of the N-CIO statements, Y-CIO descriptions that matched the Technical implementation approach were about projects that had specific technical requirements determining how they should be completed. The one Y-CIO who emphasized technical drivers, Y5, had only been on the leadership team for eight months. N-CIOs described frequent instances of technical drivers causing the institution to act where may not have otherwise, such as when the vendor stopped supporting the ERP system at N5's institution or the insurance company required that N1's institution implement an emergency notification system. None of the Y-CIOs described situations where a technical need forced the institution to move forward.

All Y-CIOs made statements that matched a Strategic implementation and decision-making approach. These statements most frequently reflected formal systems and processes but also included some informal approaches to encouraging a strategic perspective during implementation. Strategic implementation approaches were not mentioned by most N-CIOs and N6 was the only N-CIO who mentioned a strategic plan

or any other formal system of strategic decision making that looked at organizational drivers rather than specific project needs.

Website

All N-CIO and Y-CIO IT division websites focus on technical support and services for end users. One of the N-CIO IT division websites was accessible from a single link off the institution home page compared with three Y-CIO IT division websites. The home page for three N-CIO institution home pages had some or many links related to technology compared with five Y-CIO institution home pages. Technology links for both N-CIO and Y-CIO institution home pages were comprised mostly of links to social media features like Facebook, LinkedIn, Twitter, Flickr, and YouTube (see Table 23).

Table 23. ***Comparison of Technology Links between N-CIO and Y-CIO Institution Home Pages***

	Ease of Getting to IT Site		Technology Info/Links		
	Easy	**Hard**	**Many**	**Some**	**None**
N-CIO	1	5	1	2	3
Y-CIO	3	3	1	4	1

CIO Disposition

Five of the N-CIOs more frequently characterized activities or situations as making effort more difficult or creating risk for projects, as challenges, compared with all of the Y-CIOs characterizing activities or situations as enabling improved approaches, easier effort, or new projects that could benefit the organization. Most N-CIOs described

challenges as external influences that they had to accept or work around and opportunities as situations they could take advantage of. Most Y-CIOs described challenges as things they could change and opportunities as situations they made happen. Each group had one member that characterized challenges and opportunities more consistent with members from the other group. N3's description of opportunity and the importance of communication, on what he could do to improve communication and technology projects, was similar in tenor and substance to descriptions from Y3, Y4, and Y6, each of whom talked about what they are doing or how they behave to create opportunities. On the other hand, Y5's description of opportunity and challenge appeared to mirror that of N1, with the one key difference being that he is currently a member of the leadership team while she is not, in both cases based on the preferences of the current president.

Leadership Team Presence

Both N-CIOs and Y-CIOs emphasized being present to hear what is happening as the most important benefit to being on the leadership team. All Y-CIOs expressed value in being on the leadership team and an interest in staying on the leadership team. Several Y-CIOs also talked about ways they could be or had been successful when not on the leadership team, emphasizing the importance of the people at the institution rather than the leadership structure. One N-CIO did not see value in being on the leadership team, and another did not feel he could be successful on the leadership team with the current president. Both N-CIOs and Y-CIOs acknowledged the additional work required of being on the leadership team and spoke to the need to delegate more responsibilities to IT

division team members. N-CIOs and Y-CIOs foresaw or have experienced drawbacks to being on the leadership team. Most of these revolved around becoming one of the decision-makers and the risk that entails. As Y1 described, the CIO becomes one of the "wolves" rather than someone for whom others are advocating.

Several of the institutions had external reviews, either as a special effort or as a part of the standard review process. Interestingly, all institutions who performed external reviews received a recommendation to have the CIO sit on the leadership team. Not all institutions chose to follow that advice, but many did, and that was a frequent driver for Y-CIOs being appointed to the leadership team. The other reason Y-CIOs cited for being appointed to a leadership team was the arrival of a new president who decided change the institution's leadership structure.

Role of the President or Supervisor

When talking about projects or thinking directly about the benefits and drawbacks of serving on the leadership team, several N-CIOs and Y-CIOs indicated a factor they thought may be more important than presence on the leadership team for determining success, the role of the president or of their supervisor. Membership on the leadership team is usually determined by the president, so for most CIOs, being included on the leadership team has been a result of pre-existing or changing perceptions of the president. Several of the CIOs interviewed have had experience both on and off the leadership team. N1 has moved on and off the leadership team while at the same institution, depending on the preferences of different presidents. She started as a CIO not on the leadership team but an external review, completed at the request of a trustee, included a recommendation

to put her on the leadership team and the president agreed. She found being on the leadership team valuable to her role, but after that president retired three years ago, the new president removed her from the cabinet and changed her reporting line from the president to the provost. As she described:

> The last 3 years have been kind of going backwards I think in terms of IT at [my institution]. Not that you know we haven't still had conversations but they haven't been as a high level so the communication channels have just gotten more difficult.

The move off the leadership team resulted in a number of challenges and issues that N1 had not experienced when on the leadership team, especially related to communication and expectations. Interestingly, she found that many of the challenges were not directly with the president but rather with others after their behavior toward her appeared to change based on her diminished role: "we seem to have a lot more problems getting cooperation with some now than we used to, and I think some of that is because they think, 'oh well, you're just IT. '" In other words, the perceptions about IT held by the president may become an example followed through the institution, and if he or she does not see technology as an issue of importance for senior leadership, it may become of less importance across all levels of the institution. At N1's institution, yet another new president has recently started, and she is optimistic that she will be added back to the leadership team. The reason for her likely forthcoming inclusion is the same as why she was removed, the president's perception of the strategic importance of technology at the institution.

Y5 reported a similar story about his move to the leadership team. Although he has only been at the institution a few years, he was move to the leadership team about 8 months ago. This move was not the result of his work or any attempt on his part to make his role or the role of IT more visible. Rather it was simply the arrival of a new president with a different perspective:

> We went almost a night and day change in types of president, in terms of support of technology and understanding of technology. So, it's hard for me to say a hundred percent that made a huge difference, because, I think to some degree, it is the person sitting at the president's office that's made a difference. (Y5)

While Y5 expressed value in being on the leadership team, he did not feel it would have been as important or useful with the previous president. With a president he described as not "technology friendly," he would not advocate strongly that he should be on the leadership team because "I'm not sure it would make a difference."

The importance of the relationship with the president was stated even more strongly by the story of N2, where the president and N-CIO have had a close working relationship that has become strained and challenged. After leaving the institution for a few years, the president recruited N2 to return as the CIO as showed significant interest and hope for what he would do in the role. N2 feels he has done a good job but also senses he is not meeting the expectations of the president: "as I do my job in a way that I feel like is good, I feel I have been incredibly successful he is getting more and more disappointed." The disappointment appears to come from a fundamental disagreement about the purpose of technology at the institution and the criteria by which it will be considered successful. As N2 described:

> I think that excellence is something that you build slowly over time. And that is a careful process of being good at every single thing you do, and I feel like we are doing that. I am working towards excellence . . . I don't know what he thinks, but I guess I know that he spends time and he would like me to spend time on things that are visible in and of themselves for the purpose of being visible.

N2 appears to focus on the importance of completing the Functional Support role of an IT division at the highest degree of reliability, while being aware that senior leadership is looking for the IT division to include an important role in Innovation. The challenges created by this disagreement about the role of technology are such that he would prefer to keep his distance from the president and expressed concern that being on the leadership team would exacerbate tensions:

> I think that having an IT director on a cabinet with the president requires team work with the president. I mean I think that if there any kind of stress and strain between IT and the president to bring it in closer I don't see how that is going to help the institution.

In this instance, the N-CIO feels generally successful with the campus community, but the perceptions of the president are determining overall success he senses that perceptions are "shifting out of my favor." While each of these stories show a different relationship with the president, they each highlight how some of the N-CIOs consider the perceptions of the president, as well as other members of the leadership team, to be more important than membership on the leadership team.

In addition to the importance of the relationship with the president, several CIOs referenced the importance of relationships with other leadership team members and their supervisor. N3 reported having an open and strong relationship with the president and

leadership team and that the president of his institution considers the role of technology as important enough that the CIO is treated as a “C-level” or senior executive. Although he is not a member of the leadership team, he attributes his ability to act as a senior executive in part to the active support received from the president and other members of the leadership team:

> So I feel like I’m being heard, but a lot of this is behind the scenes chit chats and talking. I attend almost all of the faculty meetings, receptions here and there, and you know, you have to participate actively. Some people are much better technically. I used to be a geek. But these days, I tell people I’m not a geek.

One thing that is striking about N3’s description is how much of an active role he described playing in creating the relationships. So while the president’s perceptions are important, N3 described the role the CIO can play in shaping those perceptions. In his case, the communication worked so well that the president was aware of significant technical needs and costs and was able to secure significant funding from a donor for a major technology project.

In addition to the influence of a president on the CIO role, several Y-CIOs described situations where they had been successful when not on the leadership team. In each of these instances, the quality of their experience hinged on the role of their supervisor. Y4 described an experience at a regional university where he was able to achieve the most frequently mentioned advantage of being on the leadership team, hearing what is happening at the institution, by building connections outside the leadership team:

> Can you [hear about other units' issues] that without being [on the leadership team]? When I was at a regional university in Kansas, the answer to that is you can, but you've got to make sure you've got the right connections . . . We had a very potent dean's council and that was made up of the dean of the library, Dean of Arts and Sciences, Dean of the Business School, the vice-president for Academic Affairs, the Dean of Online Learning, and me. It was a very . . . it was probably the best group I have ever worked with.

In this case, institutional leaders created connections by forming a group outside the leadership team. Y4 attributes the success of this group to the supervisor of most of the roles included: "I really credit the Vice-President for Academic Affairs there for setting up that kind of community, if you will." A regional university may have a larger administrative structure, so it is not clear if the leadership team at his previous institution could be considered equivalent to that of his current institution. But his story was in direct response to considering the value of being on the leadership team, and he described this previous experience as being applicable to his current situation.

Y1 has an example of success off the leadership team that remains within the context of the institutions in this study, in fact, from the same institution she is at currently. About four years ago, consultants recommended that her role be moved to the leadership as part of a regular external review that all units at the institutional receive periodically. The president agreed with the recommendation, and her reporting line was changed to the president in addition to putting her role on the leadership team. Prior to the change, she had a dual reporting line to the Dean and the Chief Financial Officer that she found actually worked well:

> Now luckily both of those gentleman really have the same vision for the college and I really can tell you that I enjoyed working for both of them and didn't really

> find it all that difficult, but [the consultants] thought that was horrible and then of course one retired and the other one stepped down from being the dean and the new folks that came into the role could not see eye to eye, I guess I've been truly blessed that I didn't have to.

Her experience benefited significantly from the individuals in these roles, and she suspected it would not work as well with the current individuals. Even so, she does not describe her current leadership team membership and reporting line to the president as being easier than what she had experienced previously:

> You know the funny thing is that I tell people based on what I'm now experiencing, I actually had a very good experience reporting to the dean and the chief finance officer because it's the quality of the two gentlemen who have sat on those seats to do—not the gentlemen, but—and now my experience is I'm just one of the wolves at the table.

She did not describe her current situation on the leadership team as being better than her experience off the leadership team and saw trade-offs for the two experiences. Her experience off the leadership team was contingent on the "quality" of the people she reported to, and she implied that she would not anticipate having a similar experience with the current people in those roles.

Summary

CIOs who are not on the leadership team (N-CIOs) emphasized the importance of the IT division providing technology development and support to help faculty, staff, and students do their work as well as identifying and providing technology solutions that help the faculty, staff, and students do their work better. N-CIOs described their roles primarily as educating people to better understand technology, including opportunities,

implementation, and costs and as providing management oversight for a team of people who provide technology development and support. The most emphasized implementation approach for N-CIOs involved collaboratively determining what should be done with a group of people who have a stake in the project. In addition, N-CIOs described decisions being made due to technical drivers and needing to employ persuasion to convince others of the viewpoint. N-CIOs tended to describe activities and situations as challenges that made effort more difficult or created risk for projects.

CIOs who are on the leadership team (Y-CIOs) also emphasized the possibility for IT divisions to provide technology solutions that help the institution provide new approaches to achieving its mission or be considered by peers as an innovative institution in addition to the essential support and operations improvement roles. Y-CIOs described their roles as including three major areas of focusing: (a) determining how efforts and projects fit strategically within the larger organization, (b) managing a team of people who provide technology development and support, and (c) ensuring technology development and support projects are completed successfully. The collaborative approach to implementation and decision-making was emphasized most frequently by Y-CIOs, but the majority also emphasized formal and informal strategic approaches that focused on business processes and organizational drivers. Y-CIOS tended to describe activities or situations as opportunities that enabled improved approaches, easier effort, or new projects that could benefit the organization.

Both N-CIOs and Y-CIOs emphasized how IT divisions provide a critical foundation of support for institutions and pointed to collaborative approaches for as the

most frequent way to make decisions or implement projects. N-CIO descriptions tended to focus on specific people or projects, while Y-CIO descriptions were more frequently about structures and strategies. Both N-CIOs and Y-CIOs cited being able to hear what is happening at the institution as the key benefit to being on the leadership team. Similarly, both groups saw trade-offs between the two experiences of being on or off the leadership team but generally felt that being on the team was preferable. Several Y-CIOs reported administrative responsibilities that extended beyond technology. Both N-CIOs and Y-CIOs emphasized the importance of the role of the president or supervisor, often claiming it was more influential than membership on the leadership team.

CHAPTER V

CONCLUSION

The purpose of this study was to better understand the experience of CIOs by exploring their relationships with the leadership team and their descriptions of technology projects they consider strategically important. In the following chapter, I explore the implications of the study's findings and offer suggestions for future research. I first consider the significance of responses to surveys and then look at what we can learn about the CIO experience from case group and cross-case findings. I examine the CIO experience following the propositional framework of IT division role, CIO role, and implementation and decision-making approaches and then consider how those are reflected in the institutional home pages and IT division websites. I explore findings related to the CIO disposition, perspectives on leadership team membership, CIO opportunities beyond the technology role, and perceptions about the importance of the role of the president or supervisor. Finally, I propose future research studies based on the results of this study.

CIO Surveys

The CIO surveys were designed primarily as a means of identifying participants for interviews but were also an opportunity to gather information from a larger group. Of the three questions that gathered non-administrative data, responses to the CIO Role appeared most relevant. The emphasis CIOs placed on developing IT strategy,

participating in institutional strategy, managing IT services, and promoting innovation all align reasonably closely with what the literature suggests the focus of a CIO should be [sources]. Interestingly, Y-CIOs were much more likely to include "Participate in overall institutional planning" as one of their three most important roles. This trend matches what people would likely have greater opportunity to do but may also be suggestive of a difference in how they perform their roles and in how their role is perceived based by others on campus. This finding is also consistent with Goldstein (2008a), who found Y-CIOs reported greater participation in institutional decision-making. Not only did fewer N-CIOs than Y-CIOs include institutional planning as an important role, the number of N-CIOs who included it made the role essentially equivalent to a few other roles, including "Promote innovation through technology" and "Manage information technology systems." The relative importance of institutional planning was not just below managing IT services but was equivalent to other roles as well. A greater percentage of N-CIOs, on the other hand, included "Manage IT services" as one of their three most important roles. In this case Y-CIOs still frequently reported managing IT services as one of the most important roles, but its relative importance was moved below institutional planning. Both Y-CIOs and N-CIOs most frequently included developing IT strategy and managing IT services as most important roles, but as discussed below, the interviews show a different emphasis.

Survey respondents were also asked to indicate the "two most important IT projects implemented or in progress on campus in the past year." This was in part to prepare for the interviews but also could be show trends as well. Y-CIOs and N-CIOs

reported similar answers, suggesting that the types of major IT projects are not affected by a CIO's membership on the leadership team. CIOs reported big projects that are either part of a significant foundation for all work done at the institution (network, phone) or involve broad impact to major functions of the institution (ERP).

Answering the question "Are you a member of your institution's leadership team (i.e. "President's Cabinet, Executive Team, etc."), 18 respondents (35%) indicated "Yes." Studies have suggested that closer to 50% of CIOs overall are members of the leadership team (EDUCAUSE, 2010; Hawkins & Rudy, 2008; Lowendahl et al., 2008a). None of the survey responses or follow up interviews provides any data that could help explain this difference. The most recent EDUCAUSE Core Data Service report (EDUCAUSE, 2010) provided a breakdown of membership on leadership teams by institution type, and the institutions included in this study have not been lower than the average. It may reflect what CIOs would be interested in and willing to complete a survey for a study about CIOs and leadership, so the percentage of people on leadership teams who received the survey may be closer to 50%, but CIOs who were not on leadership teams were more likely to respond.

Further, during follow-up interviews two respondents who had stated "Yes" on the survey described their position as not being on the leadership team. Concerned about maintaining effective rapport during the interview, I did not question this discrepancy and moved those respondents to not being on the leadership team for the rest of the study. This means the percentage of respondents who are members of the leadership is even less than what the survey results show. More importantly, an inaccurate answer from two

respondents calls into question the reliability of other respondents' answers to this question who did not receive a follow up interview and suggests that for this study the primary function of this response was for preliminary identification of follow up interviews and that analysis of survey results using this question are suggestive at best.

IT Division Role

The primary roles for an IT division as emphasized by both Y-CIOs and N-CIOs are Functional Support and Operations Improvement. CIOs appear to have consensus IT divisions must provide technology development and support to help faculty, staff, and students do their work as well as identify and provide technology solutions that help the faculty, staff, and students do their work better. This result is not surprising, matching both the history of technology implementation in higher education and some of the core arguments for why a CIO should be on the leadership team. Technology has become a pervasive part of how a higher education institution does its work, from faculty doing teaching research and service to staff providing support services and administrative processing to students completing coursework and engaging in the campus community. As Y5 described, "It's one of those foundations of service and support that cut across the entire community." Technology first and foremost must work in all of these environments, and CIOs see the IT division as have the primary responsibility for making that happen. This belief was reflected in their responses to questions about the purpose of the division, their descriptions of technology projects, and even in IT division websites.

Although the core function of the IT division was consistent, Y-CIOs appeared to have a slightly broader vision for what an IT division could do, especially once the basic

services are provided. They were more likely to emphasize the function of helping other campus units think through business processes as part of a technology implementation and some emphasized innovation, or solutions that help the institution provide new approaches to achieving its mission or be considered by peers as an innovative institution, as a significant priority. Institutions that emphasized innovation were clearly reflecting an institutional priority. N2 indicated that he believed his institution would like to prioritize innovation as an IT division function but has resisted, focusing instead on being in "infrastructure mode." Despite recommendations to include the CIO on the leadership team, N2's president has elected not to but has added a public relations officer. This study focused on the CIO perspective, so we cannot know why the president has made this decision. But it is worth noting that N2 suspected the reason is that "he has not felt the need to be closer to or to have tighter connection with operations." What is telling about this response is the focus on "operations," the primary role of the IT division but not the primary are of interest for the president. N2 acknowledged that he would need to complete more of this type of project if her were on the leadership team, although he characterized them as "failed" projects. The way Y-CIOs describe the Innovation role as being tied to institutional priorities paired with N2's story suggest that an institution that wants to prioritize innovation may find more success when bringing the CIO more clearly into the institutional prioritization discussion as a member of the leadership team.

CIO Role

The Management role was emphasized by both N-CIOs and Y-CIOs as an important part of what they do, which is consistent with the emphasis CIOs placed on

Functional Support as an IT division role. One of the key ways to provide Functional Support across a large organization is to have an effective team providing those services, and focusing on providing oversight for a team of people who provide technology development and support would be a natural way to help make that happen. Both N-CIOs and Y-CIOs mentioned professional development as well as support and guidance of team members. Y-CIOs, however, focused more on the structure of the groups, which suggests more time thinking about higher level strategy and less time on individual projects and efforts. This matches descriptions from both N-CIOs and Y-CIOs about the how being on the leadership team affects a CIO's workload. N-CIOs anticipated and Y-CIOs reported being on the leadership team as increasing their workloads and indicated that they would or did reduce time spent with "hands on" work.

Both N-CIOs and Y-CIOs talked about the need to help people better understand technology, including opportunities, implementation, and costs, or the Educator role. Lowendahl et al.(2008) found that only 20% of leadership team members considered themselves knowledgeable about "next generation technology," so it is not surprising the most CIOs referenced the need to provide education. What is surprising is that N-CIOs emphasized that need more than Y-CIOs. Interestingly Y-CIOs did reference communicating with leadership team members and educating them about technology as an important benefit to being on the leadership team. This suggests Y-CIOs can spend less intentional focus on the education effort and that they may be able to achieve similar education goals more easily than N-CIOs. The frequency of contact with leadership team members alone may explain this difference. N-CIOs also talked about the challenge of

having their opinion considered “weighty” and the benefit of being on the leadership team as being listened to more seriously by the entire campus community. The symbolic importance of being on the leadership team thus may affect the ways in which some CIOs perform the Educator role and the ease with which they are able to accomplish the goal of improving technology understanding.

The similarity of Strategist and Implementer roles suggests that they are viewed similarly by N-CIOs and Y-CIOs, so the difference is not in kind of effort but in how much effort each spends. Y-CIOs emphasized both roles a great deal more. Both N-CIOs and Y-CIOs made statements matching the Strategist role, or a focus on how efforts and projects fit within the larger organization, considering long term operations management and achievement of mission. This suggests a consensus that this is one of the CIO roles, which matches the literature (Bell, 2006; Cartwright, 2002; Hawkins, 2004). Most of the N-CIOs, however, made only passing reference to a strategic role, sometimes in terms of what the role should be rather what it is. Y-CIOs made much more frequent mention of the role and appear to spend more time actively in the role. This is consistent with what was anticipated—as a member of the leadership team, a Y-CIOs function would more formally and explicitly involve strategy.

Seeing a similar finding for the Implementer, however, is surprising. A focus on ensuring technology development and support projects are completed successfully would seem to be more consistent with the emphasis N-CIOs placed on the survey for “Managing IT services” as well as the different descriptions N-CIOs and Y-CIOs provided for the Management CIO role. For both N-CIOs and Y-CIOs, focusing on

ensuring technology development and support projects are completed successfully meant spending effort and time in a project management role. Examining the specific statements they made that match the Implementer role reveals a possible explanation. When describing project management, N-CIOs talk about “figuring out how long this is going to take” and similar time and effort project management needs. Y-CIOs, on the other hand, talk about taking care of “politics” and communicating status to board members or other senior leadership, emphasizing the communication component of project management. In this sense, the descriptions of project management appear to match the trend of N-CIOs being more “hands on” than Y-CIOs. Although Y-CIOs emphasized the Implementer role more frequently, it was in the context of only larger projects and with a focus on communication.

Implementation and Decision-Making Approaches

The emphasis on Collaborative implementation and decision-making approach for both N-CIOs and Y-CIOs is striking. Making decisions jointly by a group of people involved with or who have a stake in the project was clearly a preferred approach and could be considered a best practice. The way this was done, or at least what CIOs emphasized, may provide insight into another difference about how N-CIOs and Y-CIOs focus their effort. N-CIOs described collaborative work on specific projects, ways in which they got multiple people from across groups to work together on projects. Y-CIOs, on the other hand, described the systems they had created or participated in that required collaboration or the informal expectations they had created that encouraged it. The

difference appears similar to the level to which CIOs are “hands on” with efforts versus creating the systems and expectations in which others do the majority of work.

Although not emphasized as much as some other approaches, all of the CIOs made statements that matched the Persuasive approach, suggesting that persuading others to share their viewpoint is another common and important tool for CIOs. N-CIOs emphasized Persuasive more but also characterized it differently. Some of the N-CIO approaches focused on indirect persuasion, convincing students in order to convince leadership or focusing on an interest in mobile devices in order to implement a content management system. All of the Y-CIOs described their method of persuasion as making a direct case to the individuals they were seeking to convince. Interestingly, the N-CIO who talked about making a direct case, N3, was also the one who described himself as a “C-level” administrator and emphasized strong relationships with institutional leadership. This difference parallels perceptions N-CIOs had about their opinion not carrying the “weight” of other leaders.

Most N-CIOs and Y-CIOs made statements that matched a Technical approach, but only one Y-CIO, Y5, emphasized the approach, and he has only been on the leadership team for eight months. Four N-CIOs emphasized specific technical requirements determining how projects should be completed, but the most striking difference between N-CIOs and Y-CIOs is in the way they described how the approach worked at their institutions. Several N-CIOs described being forced to make a decision or take action because of a technical driver, usually a system no longer being supported. In many of these cases, they had suggested a solution earlier, but no decision was made until

the technical situation required it. Y-CIOs described making decisions based on technical abilities or needs but did not mention any situations where the technical driver was required to convince the institution to take action. This parallels descriptions related to the Persuasive approach and is suggestive of the challenge some N-CIOs face when trying to make a direct case for what needs to be done.

The difference between N-CIO and Y-CIO descriptions and emphases of the Strategic approach is strong. Most N-CIOs made no mention of an approach that focused on business processes and organizational drivers, and only N6 mentioned a strategic plan. On the other hand, all Y-CIOs mentioned at least one strategic approach, and four emphasized strategic decision-making. Y-CIOs described both formal and informal strategic approaches, and both were considered important ways the Y-CIOs worked with the IT division and the institution to determine what should be prioritized and how those priorities should be completed. Strategy was not a common tool that N-CIOs used but rather, when paired with their description of the Strategist CIO role, a concept they supported as something that should be done in an ideal world. Y-CIOs described strategy as something they did on a regular basis. Given the descriptions for Persuasive and Technical approaches, it is not surprising the N-CIOs might view the Strategic approach as something out of reach. Direct approaches appear to have not worked, but they have found success with indirect approaches. What these results do not clarify is why some N-CIOs have had challenges with more direct approaches. Not being on the leadership team may reduce the frequency of interactions with leadership or may be indicative of an opinion not being valued as much. The cause could also be that the ways some N-CIOs

are less skilled at making direct approaches. It is worth noting that none of the Y-CIOs described indirect approaches to making decisions or moving projects forward.

Website

As noted above, the technical focus of IT division websites supports strongly the emphasis CIOs place on the Functional Support role of IT divisions. There were no other IT division page attributes that provided any trends or illustrated roles or approaches. The institution home pages, however, had some differences that are at least suggestive. More of the Y-CIO IT division pages were easier to find from the home page and more Y-CIO home pages had links to technology resources, particularly social media, than N-CIO home pages. While these numbers appear suggestive, they can at best be considered preliminary. When adding the context of the interviews, these apparent trends become less clear. Those institutions focused on innovation, Y1 and Y6, did not necessarily have more technology links. CIOs who emphasized transparency and communication, like N3 and Y4, did not have IT division pages that were easy to find. At most, the findings related to the website support Functional Support as a core IT division role and point toward a direction for possible future research.

CIO Disposition

The way in which CIOs characterized activities and situations showed a strong difference between N-CIOs and Y-CIOs. Five of the N-CIOs most frequently characterized activities or situations as challenges, as making effort more difficult or creating risk for projects. The challenges N-CIOs described focused on mostly on people with a few references to technical issues. In each case, these situations were referenced as

obstacles to overcome or barriers that would make a task impossible. All of the Y-CIOs most frequently characterized activities or situations as opportunities, as enabling improved approaches, easier effort, or new projects that could benefit the organization. The situations described varied widely but all focused on either actions they had taken or ways of being. Y-CIOs talked about what they had done to create or leverage an opportunity or talked about generally being positive. The difference in descriptions between N-CIOs and Y-CIOs appeared to be an expression of agency, a sense of whether the CIO feels he or she has agency in these situations. Most N-CIOs described situations where external drivers had an impact on them or their projects, instances where they did not feel agency over what was happening. Most Y-CIOs described situations where they were the primary actor, instances where they clearly had agency. Interestingly, Y2 faced a challenge where she clearly did not have agency in being moved from a single leadership team to the lesser of a pair of leadership teams. But when she characterized the change, she focused on how she still had agency within the new role rather than what had been taken from her. This difference in sense of agency between N-CIOs and Y-CIOs has strong parallels to the roles and approaches CIOs described and appears to be a key difference in how an N-CIO or Y-CIO experience his or her work.

Two CIOs did not match the emphasis of their counterparts, N3 an Y5, but this appeared consistent with the full experiences and descriptions. N3 had more similarities with the Y-CIO group in how he described himself and situations but he actively considered himself a “C-level” administrator and appeared to receive support as one. Y5 described situations more like most of the N-CIOs, but he had only been on the

leadership team for eight months, and many of his descriptions referenced times before or shortly after he joined the leadership team.

Goldstein (2008a) found that CIOs on the leadership team were more confident about IT division outcomes and thought of their institutions as more adaptable to changes in technology and more forward-thinking in their use of technology. What Goldstein's study did not determine was if the position on the leadership team enabled CIOs to act as better leaders or if CIO positions that included membership on the leadership team attracted better leaders. Similarly, this study supports the Goldstein's findings but does not offer any clarification as to the cause.

Leadership Team Presence

All N-CIOs and Y-CIOs cited the value of being present during planning and decision-making as one of the main benefits of being on the leadership team. For some, not being present had created significant challenges when decisions were made without input or guidance from a person with technology understanding or expertise, such as when a new building was planned but no one thought to consider how that building would be connected to the campus network. N-CIOs mentioned a possible increase in perceived value of their role and the role of IT as well as the benefit of having direct access to the leadership team. Several Y-CIOs described experiences in their past where they felt they could be effective when not on the leadership team. That said, all Y-CIOs expressed an interest in staying on the leadership team. Both N-CIOs and Y-CIOs articulated drawbacks to membership on the leadership team, the primary one being an increased workload. They also saw being a decision maker as a risk and mentioned that

the CIO would have to advocate for him or herself rather than relying on others. On the whole, N-CIOs and Y-CIOs appeared to have a realistic sense of the tradeoffs of being on the leadership team. They did not appear to be seeking more authority or responsibility but rather were thoughtful about how the role could help or hinder their success and the success of technology at the institution. Two N-CIOs did not want to serve on the leadership team. N3 felt he had enough interaction with leadership already and did not see any new value coming with the additional responsibility. N2 felt that the "strain" in the relationship with his president would hinder the ability for him to serve on the leadership team successfully. Despite the exception of these two individuals, both N-CIOs and Y-CIOs stated that they would prefer to be on the leadership team. While not a surprising result, it does indicate CIOs perceive greater value to being on the team that warrants the risks and trade-offs discussed. More telling is the fact that Y-CIOs have experienced success without being on the team but all indicate they would prefer to stay on the team.

In addition to what N-CIOs and Y-CIOs stated directly about being on the leadership team, their descriptions of projects and roles provide a picture of two different sets of experiences. In a survey study of both CIOs and leadership team members, Brown (2006) investigated what criteria correlated to CIO success, including membership on the leadership team. He found that membership on the leadership team did not have a statistically significant effect on leadership team's perceptions of effectiveness. By contrast, Goldstein (2008a) found that membership on the leadership team did correlate with CIO's perceptions of their own effectiveness. This study looked not at perceptions

of effectiveness but rather sought to understand differences in how the CIO experienced his or her role relative to membership on the leadership team. While each CIO experience is unique, several trends were identified relative to membership on the leadership team. Both N-CIOs and Y-CIOs described a commitment to the success of technology projects, a strong interest in the professional growth of members of their teams, and a value in providing excellent technology support for the institution. The ways in which they describe achieving these goals, however, was different, as was the scope of what they can do. N-CIO descriptions tended to focus on technical, day-to-day work, and their role and implementation approaches were similarly focused on projects rather than strategy. N-CIOs expressed their experience more frequently in terms of challenges, often used indirect approaches to solving problems, and described numerous situations where they did not have agency in making things happen or determining decisions. Y-CIO descriptions, on the other hand, focused more on team structures, delegation of day-to-day work, and an active use of formal and informal strategic approaches. Y-CIOs more frequently talked about opportunities, focused on direct approaches to achieving goals, and expressed a sense of agency in the majority of their interactions and experiences. While both N-CIOs and Y-CIOs described ways of being effective and successful regardless of membership on the leadership team, these differences in experience suggest that they ways in which a CIO can be effective changes based on whether he or she is on the leadership team.

Roles beyond Technology

The trend of Y-CIOs being given broader responsibilities is particularly interesting to me, as it matches my own experience. Several Y-CIOs have received additional and often growing administrative responsibilities outside of technology. No existing literature has explored this trend, and this study offers only preliminary findings that are suggestive of avenues for future research. One N-CIO has broader responsibility, N2, which was part of what was offered to bring him back to the institution, and he describe the president as being hopeful for what he would accomplish. N2 expressed that he thinks the president is "disappointed" and "frustrated" that he has not acted as a "stronger and a bigger leader" and gave no indication that he would see any future growth in responsibility.

Although Y-CIOs described a trend of getting broader responsibility, why this is happening is not clear. Y4 described his new responsibilities as resulting from the pervasive role of technology at the institution: "CIO's have a tendency to know their institution probably as well as nearly anyone because of their broad swath that we really cut across the institution." N-CIOs, however, do not appear to be offered the same opportunities, and all CIOs indicated a significant number of cross-cutting, institution-wide initiatives that would fit Y4's description. It may be that membership on the leadership team makes this more apparent to institutional leadership, and that is why a Y-CIO would get additional responsibilities. It may be a function of proximity, as suggested by Lowendahl et al. (2008a), where they encourage viewing all chances to interact with leadership as opportunities to participate in institutional planning and decision-making.

The additional responsibilities may also result from those individuals have effective management skills, which is similar to the challenge Goldstein (2008a) identified in determining whether Y-CIOs consider themselves more effective because they are on the leadership team or because Y-CIO positions attract better leaders.

Role of the President or Supervisor

One of the most significant findings of this study is the importance of the role of individual leaders. Most of the literature has focused on whether or not the CIO is a member of the leadership team (Cartwright, 2002; Goldstein, 2008a; Hawkins & Rudy, 2008; Pitkin, 1993) or on the CIO's reporting lines (EDUCAUSE, 2010; Lowendahl et al., 2008a). No research has referenced the importance of who is in other leadership or supervisory roles, and how their approaches relate to the experiences of CIOs. Goldstein (2008a) looked at leadership styles for CIOs and how that related to CIO perceptions of success but did not examine any other members of the leadership team. Brown (2006) looked at leadership team perceptions of CIO effectiveness and developed a measure of the "organizational view of IT" in order to determine if it had an impact on CIO effectiveness. His study did not find a correlation between this "organizational view" and CIO effectiveness, but he did cite organizational view as one of the ways a CIO could be successful when not on the leadership team. Although this study does not investigate the perceptions of other leadership team members, the stories of both N-CIOs and Y-CIOs demonstrate a significant role the president or CIO supervisor plays in the role and success of the CIO.

N-CIOs described the president and his or her perceptions as being the key driver for whether or not they are on the leadership team. Further, they pointed to the president or supervisor as one of the determining factors for their success. For N2, the difference in expectation and viewpoint between himself and the president was a clear limiting factor in his own success. He saw the relationship as strained, believed his work was perceived as not meeting expectations, and expressed a desire to not be on the leadership team with the current "stress and strain between IT and the president." N3, on the other hand, cited his supervisor and the rest of the institution's leadership as a critical part of his success. Although he is not on the leadership team, he considers himself a "C-level" leader and expressed that the strong support he receives and frequent communication he has with institution leaders. In all of these cases, the president and institutional leadership were seen as determining what is possible at the institution, and presence on the leadership team was not seen as a way that could be changed.

Similarly, when asked about leadership team presence, Y-CIOs cited examples from their own experience where they were able succeed without being on the leadership team, and each of these success stories hinged on the people around them, particularly their supervisor. Y-CIOs talked more about changing perceptions of those around them, so it is not clear if they could envision success on a leadership team without support from the president. The fact that they are on the leadership team suggests the president views technology as important, so it may be a CIO would not likely have one without the other and that presence on the leadership team is an indicator of the perspective of the president. This viewpoint was expressed by both N-CIOs and Y-CIOs who had been

moved off or on the leadership team after the arrival of a new president. It is important to note that no Y-CIOs and only two N-CIOs stated they would prefer to not be on the leadership team. The role and perceptions of the president and other leaders may be perceived as more important for overall success than leadership team presence, but being a member of the leadership team was described as a significant value for CIOs and may also be a symbol of the perceptions of the president.

Suggestions for Future Research

This study provides a launching point for several studies that could expand or clarify these findings. The tendency for N-CIOs to describe situations as challenges and Y-CIOs as opportunities was striking, but analysis only left room for descriptions to be classified as either challenge or opportunity, which simplifies what is likely a complex perspective and experience. The findings are strong enough that they are meaningful even in a simplified version, but exploring these attitudes in more depth would provide a deeper and broader understanding of what is clearly an important part of the CIO experience. A future study could use a more nuanced proposition framework to analyze trends in descriptions, which could confirm or reframe the more general results of this study.

A related study would be to investigate the question of agency more directly. While this study found that N-CIOs describe situations and events in ways that imply a lesser sense of agency than that implied by descriptions form Y-CIOs, it was an unanticipated finding rather than a focus of the research questions. The general finding could benefit from a study that addresses the question more directly.

Another unanticipated finding was the pattern of Y-CIOs being given administrative responsibilities beyond technology. A broader study could explore the pervasiveness of this trend, while one that looks in more detail at situations where this is happening could help distinguish the role of technology from the role the skill sets of the individual CIOs. Such a study would benefit from including perspectives of presidents or other leaders who are making the decisions to increase administrative responsibility beyond the more tradition CIO role. It may not be possible to fully separate and identify the causes of this trend, but exploring in greater depth instances where it has happened may help CIOs better understand and apply success strategies in their own work.

One of the most significant findings of this study was that CIOs perceived the president's attitude toward technology and the role of the supervisor as more influential on their experiences than leadership team presence, which suggests an area of research that has received little attention. Future studies could examine the relationship between president and the CIO in greater detail to investigate how differences in that relationship change the experiences for both president and CIO. Other leadership team members could be interviewed to better understand how technology is talked about in leadership team discussions or leadership team meetings could be observed to see how technology discussion occur. The perceptions and beliefs of the president about technology could be a starting point for a number of studies that explore if and how differences in the role relate to the experience and implementation of technology on campus. For many institutions, the inclusion of IT on the leadership team is still relatively new. Working with leadership team members and presidents to explore how technology was added, why

they chose to add it, and the value they have perceived from its inclusion would both deepen understanding of the influence of the president but also establish relationship between these perceptions and being included on the leadership team.

Summary

The goal of this study was to better understand the experience of CIOs by exploring their relationships with the leadership team and their descriptions of technology projects they consider strategically important. Discussions with CIOs both on the leadership team (Y-CIOs) and off the leadership team (N-CIOs) revealed several common threads through the events and roles they described. CIOs described the role of the IT division as focused on support and operations improvement, but some Y-CIOs had additional latitude as sources of innovation for the institution. Both N-CIOs and Y-CIOs identified approaches for being successful and were clearly determined to help the faculty, staff, and students use technology to achieve institutional goals. The ways N-CIOs and Y-CIOs achieved and experienced success, however, was different.

The N-CIO experience tended to focus on specific projects and team members. They described activities and situations as challenges and had identified a number of approaches to overcome or work around these obstacles. They often described events as happening to them or their teams, suggesting they did not feel a sense of agency in parts of their work. Similarly, many of their issue resolution approaches depended on indirect methods where they would focus on one group or issue with a goal of ultimately influencing a different group or issue. The Y-CIO experience tended to focus on team structures and strategy, and they were less involved in “hands on” work. They described

activities and situations as opportunities and talked about the roles they played in creating or leveraging these circumstances. This sense of agency showed through in many of the stories and is reflected in their tendency to use direct strategies to influence others.

Although the experiences of N-CIOs and Y-CIOs were different, presence on the leadership team was not the primary success factor they identified. Instead, both N-CIOs and Y-CIOs emphasized the perspective of the president or supervisor of the CIO as having greater influence on their experience than membership on the leadership team. While the president's perception of technology's importance may be demonstrated by the choice to include a CIO on the leadership team, this finding suggests that the focus of current research on leadership team membership and reporting lines may be missing the most influential factor for CIOs' experiences. While membership on the leadership team may be an indicator of different situational influence, it does provide a lens for viewing two different experiences. CIOs who are not on the leadership team described a much greater challenge in moving ideas forward, being heard, and making change happen, while CIOs who are on the leadership team described a more strategic role that includes both the opportunity to serve as more influential actors at the institution but also the additional risk and responsibility of being considered an institutional decision-maker.

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APPENDIX A

SURVEY QUESTIONS

The survey is distributed to all study participants. While it will provide some data useful for analysis, its main function is to identify potential interview participants.

Introduction:

Thank you for completing this survey about the CIO role and IT projects in higher education. Your responses will be used as part of a dissertation study, and no identifying information will be used in this or any subsequent written reports. The survey should take less than 10 minutes to complete, and you will have a chance to review answers before submitting your responses on the final page. Select the Next button on the lower left portion of the screen to review the consent form for participation in the study and to begin taking the survey.

Questions:

Section A

1. Are you the most senior IT person on your campus? [Selection: Yes or No. If the answer to this question is No, the respondent will be routed directly to Section B]

2. The three most important roles of my position are:[Multiple select that only allows three responses.]

- Develop IT strategy my institution
- Manage IT services
- Develop new information systems
- Advocate for technology solutions

- Participate in overall institutional strategic planning
- Ensure IT security
- Develop information policies
- Manage information technology systems
- Oversee IT contracts with external vendors
- Promote innovation through technology

3. What are the two most important IT projects implemented or in progress on campus in the past year? [Large open response text box]

4. Are you a member of your institution's leadership team (i.e. President's Cabinet, Executive Team, etc.)? [Selection: Yes or No]

5. Would you be willing to participate in a follow up phone interview? [Selection: Yes or No]

Preferred phone number:

Preferred times for contact:

[Respondent goes directly to Submission page.]

Section B

Please provide the contact information for the most senior IT person on your campus.

Name:

Email:

[Respondent goes directly to Submission page.]

Submission

You have completed all of the questions on the survey. You can select the Back button to review your responses or select the Next button to submit your responses and close the survey.

Confirmation

Thank you for completing this survey about CIO roles and IT projects. Your responses have been submitted. If you have any questions about the survey or research study, please contact Todd Nicolet at tnicolet@sog.unc.edu.

APPENDIX B

CIO PHONE INTERVIEW

The interviews with the CIO at selected institutions provide the core data for this study, providing data relevant to all three research questions. Interviews should last 30-45 minutes.

Introduction:

Thank you for agreeing to participate in this study. I have several questions that should help me understand IT at the university, your role, the IT division's role, and how critical IT projects are implemented. This interview should take about an hour.

Questions:

1. Describe your role's main responsibilities.

(Probes: responsibilities; reporting lines; are there decentralized technology units, and if so, how are they connected with your group)

2. Who is on the President's cabinet?

(Probes: compare to list of Administration on website; what roles do they play at the university)

4. What is the role of IT division at the University?

(Probes: what does the team actually do; how do people on the team perceive what they do; how does the University perceive what the team does; what do you think the role should be)

5. On your survey you indicated that [x and y] were the two most important IT projects implemented in the past year. Why did you identify these projects as most important?

(Probes: how was the need for these projects identified; when will they be done; what are the project goals; who else at the institution views these as important projects)

6. Tell me what is going or has gone well with the project?

(Probes: how did you know it was going well; what did you do to help ensure those things that are going well; who else was involved; how have you built on what has gone well; are there other events that have gone particularly well)

7. Tell me what is not going or has not gone as well as you had hoped?

(Probes: how did you know it was not going well; how did you respond to what is not going well; who else was involved; what did you learn from the even that you plan to apply to other situations; are there other events that have not gone well)

8. How does this project compare to a "typical" project?

(Probes: how is the project similar or dissimilar; how are the events, incidents, and issues similar or dissimilar; how is what you have done with and for the project similar or dissimilar)

9. How do you identify what projects need to get done for the institution?

(Probes: how often are new projects identified; who else is involved in identifying projects; who is involved in the decision-making; how are the goals for projects established)

10. How do you identify how projects should get done at the institution?

(Probes: who is involved in determining implementation; how are projects assessed)

11. How do you think technology strategy and projects would change if you were (or were not) a member of the President's cabinet?

(Probes: how would it change your role; what are the obstacles/drivers to making such a change; what benefits/drawbacks would you anticipate)

Closing:

Thank you for taking the time to talk with me. I appreciate your feedback. I will be sending a summary of my understanding of some of the key elements of our discussion and hope you will be able to review that summary and provide any corrections or additions to ensure I have understood your comments fully. If you have any additional thoughts or questions about our discussion or about the project, please feel free to contact me by phone or email.

APPENDIX C

WEBSITE REVIEW PROTOCOL

Home Page:
Links for IT dept? Where and what does it look like?

Are there links related to technology? Information related to technology?

IT Website:
Dedicated?

How hard is it to get to the IT Website:

What links/resources are on the page? Describe the page. What information is emphasized?

Is strategy mentioned?

How accessible is the contact info for the CIO?

APPENDIX D

CASE PROFILES

N1

Background:

You have been in the most senior IT role for 8 years. You started out not on the cabinet, but then through the intervention of trustee, outside consultation was done, and you were made CIO and put on leadership team. A new president undid that, which created a whole series of challenges. Now yet another new president is starting, and it looks promising that she will be added back to the leadership team. There are 12 people in the IT Division.

Leadership Team Presence:

Your experience having been both on and off the leadership team is that being a member:

- Allows you to hear what's happening at theinstitution
- Improves communication from IT to others
- Communicates to the institution that IT is viewed as strategically important
- Means IT is listened to more seriously and that fewer obstacles when trying to get things done
- Provides an opportunity to educate members of the leadership team

The following sections attempt to identify tendencies in how the CIO and division roles function as well as how technology projects are implemented and decisions made. Again, these are not intended to be comprehensive but rather to represent some trends in

what happens at your institution. The quotations are example comments from the transcript of our interview intended to illustrate the identified trend.

CIO Role:

Educator (Focus on helping people better understand technology, including opportunities, implementation, and costs.)

> "somebody needs to have some discussions about the different scenarios that could happen and who's likely to hear about them first and how they are going to initiate . . . how they are gonna communicate with the people who know how to use this system"

Facilitator (Focus on bringing together people with different interests and helping identify common needs and solutions.)

> "we're hearing from faculty . . . we're hearing from business areas . . . I'm hearing from my boss . . . the different committees . . . this is based on what I'm hearing, these are the things that we need to do for the coming year."

IT Division Role:

Operations Improvement (Identify and provide technology solutions that help the faculty, staff, and students do their work better.)

> "the Banner project . . . impacts so many areas and it has so much potential . . . to really improve how we do things, improve customer service, make our service, our business processes more automated, more self service online consulting . . . it is giving us capabilities we don't have right now in terms of collecting data and making it readily available to folks"

Functional Support (Provide technology development and support to help faculty, staff, and students do their work.)

> "they definitely see us as . . . the fixer uppers, the people that keep the network running. The people that keeps their computers running, and the people that, you know, can help them with their software issues."

Implementation Approaches:

Collaborative (What is done is determined jointly by a group of people involved with or who have a stake in the project.)

> "I got an additional trainer involved outside of the IT organization. In the library, there is someone that basically is very good at this because he created the library tab in CatLink . . . and I've asked him to get involved to help maybe more with some of the academic folks and he has agreed to do that."

Technical (Decision-making is focused on technical drivers.)

> "[the emergency notification system] got delayed, and the new president didn't really say yay or nay. It just sort of went into this limbo, and then finally our insurance company told us we had to have one of these systems."

N2

Background:

You are the Director of IT but also Dean of the Learning Center, which includes Library, Academic Support, and Educational Technology. You were the educational technologist at the institution but left to do consulting and after two years came back in this new role. External consultants recommended that your role become CIO and be put on the

leadership team, but that has not been done. The president was excited to bring you back but you are concerned he has been disappointed with the result. You feel you are doing the right thing but know it is not always what the President wants, which is a greater focus on innovative and high visibility projects. You believe in focusing on operational needs and slowly creating excellence through carefully planned implementation. There are 10 people in the IT Division as well as about 50 student workers.

Leadership Team Presence:

You believe that membership on the leadership team would:

- Enable you to know what is happening at the institution
- Allow use of IT to be more strategic
- Would only work if the relationship with the president improves

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CIO Role:

Implementer (Focus on ensuring technology development and support projects are completed successfully.)

> "Now this project is complicated, it has taken lot of my time, but it is different than the Google project because I haven't really had to convince anybody of anything. Everybody knows that we need more wireless, everybody knows that

> we wanted to go to N, there was no technical question, there is some question as to what company we use. But those are actually coming together pretty harmoniously."

Strategist (Focus on how efforts and projects fit within the larger organization, considering long term operations management and achievement of mission.)

> "And so that [Google] was the project I feel really good about having pulled that off. Everybody is happy with it now, nobody even questions it now, but it was very scary for these stakeholders for a number of years even though one of the reasons I feel good about it is because I saw clearly years ago that we were going to be here."

IT Division Role:

Functional Support (Provide technology development and support to help faculty, staff, and students do their work.)

> "[The purpose of the IT Division is] to support teaching and learning with technological tools . . . to increase the administrative efficiency of all the departments, you know, faculty and staff and how they are doing that and then the third one is just to keep existing systems running smooth and efficiently and risk free."

Operations Improvement (Identify and provide technology solutions that help the faculty, staff, and students do their work better.)

> "And that is the thing about Google Apps right now is everybody is using it really well. I am getting faculty members with creative applications of Google sites. I

am getting users you know, coaches and people all over came that I have no idea of making shared calendars, creating work groups that I nobody in my shop need to even monitor or know about. Hmm…all of it happening just one year after not having the capability and nobody is batting an eye. That to me is a success. It is working out great."

Implementation Approaches:

Collaborative (What is done is determined jointly by a group of people involved with or who have a stake in the project.)

"I spent two years spending resources and a lot of time on experiments and focus groups and different things that I personally thought will never work and I am happy to say it did not work. But I gave it my best shot to make those things work."

Persuasive (A person drives decision-making by persuading others to share his/her viewpoint.)

"content management system for our web site. Not everybody knows that we need it. Few people know what it is. The way that I am going to achieve it is going to be through a backdoor from my point of view but from everybody else's point of view it's mobile devices and being able to present corporate information on a mobile device. In order to pull that off, in order to translate my whole web site in to something the works on a small browser, I want a content management system."

N3

Background:

You have been at the institution about two and half years and are considered "executive staff" or "C-level" but are not a member of the leadership team. You have found significant success and support in this role and emphasize communication, transparency, and trust as keys to making it work. There are 22 people in the IT Division.

Leadership Team Presence:

You do not think it would make a difference to be on the leadership team. You have a trusted relationship with the president and find projects and ideas are supported. You feel able to act as a "C-level" position without being on the leadership team in part because you stay in frequent contact with all of the people on the leadership team

The following sections attempt to identify tendencies in how the CIO and division roles function as well as how technology projects are implemented and decisions made. Again, these are not intended to be comprehensive but rather to represent some trends in what happens at your institution. The quotations are example comments from the transcript of our interview intended to illustrate the identified trend.

CIO Role:

Educator (Focus on helping people better understand technology, including opportunities, implementation, and costs.)

> "I'm a people person to be quite honest. I'm highly technical, but I'm also a people person. And I understand budgets. I understand cost-effectiveness. I do talk. I lead our information resources council which is essentially the academic

information resource team. I've also started the thing they called "tech forums" which are pretty much open in meetings about what we're doing."

Implementer (Focus on ensuring technology development and support projects are completed successfully.)

"A lot of this is the ability to communicate, to call key people up and say, "I've got a problem." But some of it is also the necessity of figuring out how long is this going to take, campers, meaning, you know, boys and girls who work for me. How long is it going to take us to put this together? Putting in a judicious amount of slack and then getting the message to the campus community usually written by me that here's what's going to happen and although we expect to have it done sooner, we don't expect to be running until 8 o'clock tomorrow morning."

IT Division Role:

Functional Support (Provide technology development and support to help faculty, staff, and students do their work.)

"My role and main responsibilities are to put together the technical infrastructure of the college and that is probably best described by mentioning the groups who report to me. First of all is our management information system which a lot of people would call the ERP, which includes both the academic and business functions of the college. Everything supported, everything from admissions to development, alumni to academic grades, and all of that. That's one component.

Another component is academic technology, which I see as how we support students, how we support faculty, and how we develop collaborative support of curriculum, evaluations, um, and even help in some cases with individual pedagogy.

Another is user services where we support individual help desks, excuse me, through our help desk individual users, laboratory, computer labs, and that sort of thing. And also, we have a sys admin group that does both our enterprise, networks, and our hardware and operating systems that support all of the above."

Operations Improvement (Identify and provide technology solutions that help the faculty, staff, and students do their work better.)

"Then the next thing that jumped out, without a doubt, was the fact that our email system was abysmal that what calendaring system we had didn't work, or people weren't even aware that such a thing did or could exist, and that clearly was number two.

Second with that was the space for emails, which the users didn't realize, but it really transferred into the need for our enterprise storage throughout the campus. So I called enterprise storage number three."

Implementation Approaches:

Persuasive (A person drives decision-making by persuading others to share his/her viewpoint.)

"And then when the deadline really came home, I finally went to another senior administrator and said we've got a deadline on this. It has to be done, and I don't

> have the staff that can do it. You have got to hire somebody and that somebody I wanted had just given his resignation at a former institution, and I said, "Here's your chance to get it," um, ". . . to get him. This is the only chance we're going to have to get this email system done." We hired him that afternoon."

Collaborative (What is done is determined jointly by a group of people involved with or who have a stake in the project.)

> "He [the Associate Dean for Information Services] is director of all [the institution's] libraries. I effectively report to him although it's a very collaborative sort of thing and my budget is completely separate from his."

N4

Background:

You were the head librarian for the institution and were asked to serve as interim executive director of IT about three and half years ago. There was a plan to merge Library and IT, but after turnover in the Provost's role, it was decided to keep them separate. Your role in IT was made permanent about two years ago, and a new head librarian was hired. There are 26 people in the IT Division.

Leadership Team Presence:

You believe that membership on the leadership team would:

- Allow you to be there when things are being talked about
- Help you move institutional needs and ideas forward by representing technical needs and opportunities
- Enable the leadership team to be more efficient by being able to address technical

issues at that moment rather than having them talking about it without accurate information

- Be time consuming but probably well worth the time
- Involve the risk of taking the brunt of discussions when there are technology issues

The following sections attempt to identify tendencies in how the CIO and division roles function as well as how technology projects are implemented and decisions made. Again, these are not intended to be comprehensive but rather to represent some trends in what happens at your institution. The quotations are example comments from the transcript of our interview intended to illustrate the identified trend.

CIO Role:

Strategist (Focus on how efforts and projects fit within the larger organization, considering long term operations management and achievement of mission.)

"I advocate for technology with the senior administration and in theory, help to – help them to consider technology as they are setting the strategic direction for the college"

Manager (Focus on providing oversight for a team of people who provide technology development and support.)

"I think that one of my personal goals for my division is that we become more pro-active and less reactive but we; I think we do react well to people's request and needs and problems and I think that people would certainly acknowledge that we do that"

IT Division Role:

Functional Support (Provide technology development and support to help faculty, staff, and students do their work.)

> "we're the go to people when it comes to anything that relates to technology . . . we're the ones that implement all the software, let's see we under gird all the administrative and academic activities on campus. We provide product activities, technologies, all the desktop computing, printers, you name it."

Operations Improvement (Identify and provide technology solutions that help the faculty, staff, and students do their work better.)

> "And we are increasing with this project. We have added modules that will increase our integration and access to data which should make certain processes much easier like the connection between financial aid and accounts receivables—thingslike that—HR and payrolls, those kinds of changes, while they are big changes for those groups, they should result in significant efficiencies."

Implementation Approaches:

Collaborative (What is done is determined jointly by a group of people involved with or who have a stake in the project.)

> "I think what has gone well is that we've had a really good representative implementation team and a variety of other teams related to the project that have included people from across the campus. So, again we're reinforcing the fact that the ownership of the system is not . . . that IT doesn't own the whole thing. That it

is owned by the entire campus and so everybody has a responsibility to make it work."

Technical (Decision-making is focused on technical drivers.)

"We just made that decision because we knew that there were some switches and things that were at end of life and the network had grown as they tend to do. They had is it grown bit by bit over the years and so, we realized that as we were replacing switches, we really needed to have a plan to standardized what we were doing"

N5

Background:

You have been in the role of most-senior IT professional at the institution for 17 years. You were recently asked to sit in on leadership team meetings but are not considered a member and do not sit in on all meetings. There have been significant turnover in the president's role at the institution and that will be changing again this summer. The IT Division has 18 people with about 40 part-time students.

Leadership Team Presence:

You believe that membership on the leadership team would:

- Allow you to hear ideas and inform decisions
- Provide the ability to start ideas with senior staff rather than working them up through students or other avenues
- Enable you to help senior staff understand major technology issues and trends

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CIO Role:

Educator (Focus on helping people better understand technology, including opportunities, implementation, and costs.)

> "I think he's just developed a respect for us you know . . . when there had been things that we have disagreed, have a couple things were he's made a decision that we had recommended against and you know, it's one of those things that we, I'm not sure if it's fortunately or unfortunately, we were proved right."

Manager (Focus on providing oversight for a team of people who provide technology development and support.)

> "So you know I've got my head of the web and the person who's the project manager for the administrative systems upgrade started out as a music teacher in high school. My administrative systems manager started out as an entry clerk here. Another in user services was our secretary. And again it's been in each of these cases it's been you know 10 or 15 years of growth but it's you know, but there's hope."

IT Division Role:

Functional Support (Provide technology development and support to help faculty, staff, and students do their work.)

> "fundamentally what we're trying to do is provide the underlying services for the college and that's, you know, being creative in terms of servers and in terms of networking and keeping data up to date, keeping the students happy with bandwidth and the ability to play their games and obviously the most important part is the academic side of the college. But you know, and again user services tend to be part of it."

Operations Improvement (Identify and provide technology solutions that help the faculty, staff, and students do their work better.)

> "there are a number of those kinds of things that you know we're trying, you know as our people are working with users, they're looking at things that people are doing, you know, and we encourage them to . . . ask questions and make sure that either if you see something . . . ask the question. Is there some way we can do this for you or certainly as we're going through this business analysis now if the question would say, you know what are you doing that's repetitive that computers should be able to do for you?"

Implementation Approaches:

Persuasive (A person drives decision-making by persuading others to share his/her viewpoint.)

> "And you know we've done a couple of things like that you know where we started billing, you know we wanted to bill for printing. Give them x number of free sheets and then bill for the rest. We've never done that. So we convinced a couple of students senators of the righteousness of it all in exchange for using recycled paper and so it became a student-led initiative that we simply agreed to. But again that one instead of starting with the senior staff, we started with, got a VP behind us and then we went to the students so to let it bubble up from the bottom."

Technical (Decision-making is focused on technical drivers.)

> "So we got to a point on that where one of the products that we're using is going to go out of support in the next year, so till the price dropped by about 75% and three of the companies seemed to have stabilized and the products looked pretty good at this point. So it seemed definitely cheaper to stay with them than to go on to a different vendor. So we figured that if we're going to do it we're going ahead and do with the you know, most affordable way and if we're going to spend money we'll spend it on the business side of the consulting which is what we're doing and bringing the folks to work with all the officers without again trying to clean up operationally what we're doing, how we're using the system and to get rid of also a lot of the local customization that were put in 15 years ago when people set the new system as what was like the old system."

N6

Background:

You have been in the role of most-senior IT professional at the institution for 14 years. You consider your role as a director rather than CIO, which you indicated would be at the VP level and on the leadership team. You make strong use of a strategic plan for IT that is built off the plan for University. A new president was arriving the week after we completed the interview. The IT Division has 17 people.

Leadership Team Presence:

You believe that membership on the leadership team would:

- Enable you to hear discussions
- Allow you to be part of the decision-making process
- Involve you in the prioritization process
- Enable you to bring information that would help with decision-making
- Be a lot more work and responsibility
- Cause you to be a “decision-maker” without the cushion of being able to cite someone else as the owner of decisions

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CIO Role:

Educator (Focus on helping people better understand technology, including opportunities, implementation, and costs.)

> "We don't just shut the door and say here is the new way that you're going to do it no matter what. So, that's a challenge always, it's being, you know, patient and teaching people and then, you know, having them in the new system. And they start to tell other people and they almost have to see the advantages of it before they'll move to that new behavior."

Manager (Focus on providing oversight for a team of people who provide technology development and support.)

> "So, project planning is, is very much done with those team leaders, and then they go out and they select the people that are most appropriate to help them to get that project done. . . . And that's worked really well. It gives my three leaders a support group, a peer group."

IT Division Role:

Functional Support (Provide technology development and support to help faculty, staff, and students do their work.)

> "we are here to enable technology, promote technology, support the university. We're a service department. We are here to make sure that our students foremost and our faculty have the technology tools that enable them to provide an education for students."

Operations Improvement (Identify and provide technology solutions that help the faculty, staff, and students do their work better.)

> "we are trying to find one source that our students and then our employees can go to find out what they need to know and by creating a portal which is that single sing on, I log in once and I have a connection to all the different pieces of information and applications that I need . . . from one place. And it just makes life easier and it improves communication tremendously. When folks know that they have this one place that they can go and they can find out what's going on at the university, you know, what do I need to know personally . . . where do I find my grade or where do I find my bill, you know, where do I go to see my course management system and although, you know, different things I could do for my classes, how do I input grades all of that residing in one, in one place without having to log in separately and go to different web pages and search it all out make for a much better way to communicate with the community."

Implementation Approaches:

Technical (Decision-making is focused on technical drivers.)

> "That was the review of a lot of different web management type solutions. We wanted work flow . . . so we would have approval processes. We wanted to be able to control some of the content on our web . . . we have a distributed web editing type of atmospheres."

Collaborative (What is done is determined jointly by a group of people involved with or who have a stake in the project.)

> "we have an IT strategic plan . . . that was created through a process with a lot of people involved from across the university. And that IT strategic plan was based also on the university strategic plan . . ."

Y1

Background:

You have been at the institution for 10 years, although the title changed to CIO about 4 years ago as did formal membership on the leadership team. The change occurred because of recommendations from consultants doing an external review. You had a dual reporting relationship wih the president and provost that actually worked, although it was dependent on people she was reporting to and my not have worket with oher people. You have mixed feelings about the tradeoffs of being on the leadership team, especially after having had two advocates on the team and now having those roles competing for the same resources. The IT Division has 30 people, although it is currently staff at 27.

Leadership Team Presence:

You believe that being on the leadership team:

- Can vary in value dependent on who you are reporting to and the quality of that person or those people
- Includes knowing how and why your ideas did not happen or become accepted, which can be hard
- Enables you to know what is happening at the institution
- Has allowed you to work with high quality, high level people
- Has enabled you to know the board of governors

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CIO Role:

Strategist (Focus on how efforts and projects fit within the larger organization, considering long term operations management and achievement of mission.)

> "I do believe that CIO's, whatever your title is, need to get a grasp of the big picture if they haven't already gotten it, and everyday I think that you would not think that we should be involved in like runningthe cameras for security and the heating and cooling systems now run on computers that we support. . . . And you know, there are some people that came out of one place or another and they are very narrowly focused and they are not doing their college or university justice I guess. They need to stop thinking about when I used to be a programmer and think more about what is it that IT does for this whole place."

Implementer (Focus on ensuring technology development and support projects are completed successfully.)

> "If it's a huge project were we do work kind of in a matrix situation where we call people from the different areas that you know report to both of them, like this primary site has turned out to be, and the renovation of the library which is a new project, we're gonna renovate our old library and more or less take it offline, gut

> it, and put it back on line. . . . Then we pull people, whoever it is that we need the expertise, you know, our experts and I may run that project. . . . And I may hold meetings so we just come together and talk about the project and what we're going to do and what we need to accomplish and how much money and what kind of politics I need to take care of."

IT Division Role:

Functional Support (Provide technology development and support to help faculty, staff, and students do their work.)

> "I am responsible for everything that plugs in and blinks. So, what, networking, all of the software, all of the classrooms, all of the desktops, our Internet, our intranet, copiers, postage machine."

Innovation (Provide technology solutions that help the institution provide new approaches to achieving its mission or be consider by peers as an innovative institution.)

> "we always try to be progressive and we have for the iPad. So we really like to go out there and identify what's going on, keep up with things, and feel like we're not being left behind in any way, shape or form. And so, we're always trying everything new out and we have some faculty that are curious enough to go ahead and do some of these projects. So, we identified this as kind of a logical next stop to some of the stuffs we are doing with iTunes U."

Implementation Approaches:

Collaborative (What is done is determined jointly by a group of people involved with or who have a stake in the project.)

> "We'll work very collaboratively. And they have managers that worked for them, sometimes they get everyone in the room, depends on what project it is, which one of them will take the lead and it will be in their area."

Strategic (Decision-making is focused on business processes and organizational drivers.)

> "I usually sit down with my team and review all the various things and we work against a strategic plan . . . And right now I have kind of vanilla strategic plan that we are working against, based on what we see as the future, what we know are our needs. Waiting for the president to—we have a brand new president—waiting for the president to come out with his vision and start to write the college's new strategic plan so that I can then align our strategic plan with that."

Y2

Background:

You are the CIO and Executive Director of the Library and have been in the role for three years. Your institution has a new president who has been there for about 8 months and has already made changes to the leadership team structure. The IT Division and Library have 65 people across both units—many people serve functions in both areas.

Leadership Team Presence:

You believe that being on the leadership team makes it much easier to know and repond to the directions and needs of leadership. If you were not on the leadership team, you suspect you would need to develop some kind of shadow system to get the same information

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CIO Role:

Strategist (Focus on how efforts and projects fit within the larger organization, considering long term operations management and achievement of mission.)

> "So we are thinking about does it make sense to have a single learning management system across five institutions to better support the faculty and students who travel between campuses, there is a lot of cross campus fertilization joining. We are implementing Shibboleth, which is a Federated Identity Management System that will, sort of a foundational building block for a lot of other IT collaborations."

Manager (Focus on providing oversight for a team of people who provide technology development and support.)

> "So that's one thing that we do, so we are creating sort of common levels of skills and a common understanding of what's expected and then they are, for the past two years they have been working very closely to communicate more deeply with the faculty in their area."

IT Division Role:

Functional Support (Provide technology development and support to help faculty, staff, and students do their work.)

> "So there are four things, there is pedagogy, there is technology, there is scholarly communication and then there is administrative operations—the, what is it, the infrastructure that keeps a college going, so HR systems and check cutting systems and financial systems."

Strategic Partner (Serve as an integral part of the strategic plan for the institution and for facilitating progress with strategic initiatives and direction.)

> "I would say that we are at the crux of pedagogy, technology and scholarly communication. We are sort of right at the point there where all of those meet."

Implementation Approaches:

Collaborative (What is done is determined jointly by a group of people involved with or who have a stake in the project.)

> "But we do not lead, this is a project that is lead by, right now it's being lead by the enrollment group, we are enabling it. I think we are playing a great, a big leadership role in it. But and I think eventually we are probably lead by and championed by the institutional research area."

Strategic (Decision-making is focused on business processes and organizational drivers.)

> "the current situation here right now where we are, we have a new President who has launched a strategic planning process which is more than strategic planning actually. Its campus planning, it integrates the strategic plan with budget planning

and with assessment. So all of those are wrapped into, are wrapped into a single process and we are with, see that's a big part of everything that we will be doing moving forward."

Y3

Background:

You are responsible for both IT and the Library and have been in role for 15 years—the library and IT were combined immediately after you came to the institution. You joined the leadership team 7 years ago. During a regular review process, external reviewers recommended that your role join the leadership team. Your reporting line has not been to the president, although that has been looked at. Quality of the person you reported to has made the biggest difference in your work, although becoming a member of the cabinet resolved many of challenges you had been facing. The IT Division has 13 people.

Leadership Team Presence:

You feel strongly that the CIO should be on the leadership team and that one of the key benefits is being there when things are discussed. You have experienced challenges in the past with people wanting to implement things and not including IT but have found that happens rarely now that you are on the leadership team.

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CIO Role:

Manager (Focus on providing oversight for a team of people who provide technology development and support.)

> "one of the things I'm – I'm going to um…ask the guy who was the lead on the project to actually do some project management training for the rest of the staff . . . we're kinda gonna use them—their project as a model. . . . I'm going to ask this guy to kind of head up a project management . . . tutorial or a series of . . . workshops for the rest of the staff."

Implementer (Focus on ensuring technology development and support projects are completed successfully.)

> "the other thing I had mentioned earlier this ability to do test releases more carefully before we go live and put them into production. That's been huge and then it's also served us well as a ah…we've been incorporated it into our disaster recovery plans as well. We've got some copies of servers in places we've never been able to have them before because we can virtualize them and so we're – I think we're much less vulnerable to ah…some kinds of disasters."

IT Division Role:

Functional Support (Provide technology development and support to help faculty, staff, and students do their work.)

> "on the academic side, our role is to support and broadly to support teaching and learning,to provide technology and the support that enhances and facilitates teaching and learning at the college. On the administrative side . . . we support the

> . . . provide the technology and support that makes it possible to run the college . . . more or less it's to support the business activities and all of the related operations that are involved in a day to day business of running the college and of course we need the network and systems that support us as well."

Operations Improvement (Identify and provide technology solutions that help the faculty, staff, and students do their work better.)

> "a recognition of the value that they see and getting some of the things that ah…um…you know suddenly the light bulbs sometimes comes on it says, oh, yeah we could gather that information and that might help us do our work better or do our…or we'll have to do a little more efficiently so."

Implementation Approaches:

Strategic (Decision-making is focused on business processes and organizational drivers.)

> "We do have a five-year plan that we have pretty much reached…come close to reaching the end of it and we need to engage in another strategic planning initiative um…and certainly the network and virtualization was part of our last plan"

Collaborative (What is done is determined jointly by a group of people involved with or who have a stake in the project.)

> "we have a small group of academic technologists and when we're working on projects related to the academic side of our organization, their input is important. Again the advisory committee's input is important . . . that's kind of the group

that ah…the two groups that I rely on to help us set priorities on where we're gonna – where we're gonna be spending our money."

Y4

Background:

Your institution recently changed to a provost model, which caused your title to become Associate Provost. You've been there 4 years and were brought in partly because of your experience with ERP implementation. You have recently had Institutional Research added to his responsibility, for a time were responsible for the Office of the Registrar, and recently have even been given an interim role as Dean of Students. You attribute these many roles to the fact that IT has such a broad use that you are in a position to understand many different and disparate units. Your institution will have a new president starting in July. The IT Division has 30 people with an additional group of student workers who provide all tier 1 helpdesk support. You believe the most important attribute for a CIO is soft skills, particularly communication—it's not about the specific roles but the way you do it.

Leadership Team Presence:

You indicated that the most important part of being on the leadership team is hearing the issues and needs the institution is facing. You talked about how it can work if a CIO is not on the leadership team and referenced earlier experience at a regional university. Your sense from these experiences is that it is more depend on the people who are there than on the organizational structure.

The following sections attempt to identify tendencies in how the CIO and division roles function as well as how technology projects are implemented and decisions made. Again, these are not intended to be comprehensive but rather to represent some trends in what happens at your institution. The quotations are example comments from the transcript of our interview intended to illustrate the identified trend.

CIO Role:

Strategist (Focus on how efforts and projects fit within the larger organization, considering long term operations management and achievement of mission.)

> "The college within the past 18 months moved from a Vice President for Academic Affairs model to a provost model. When that changed occurred, I became Associate Provost and I also, in addition to the IT duties that I'll describe in a minute, I also was asked to assume responsibility for institutional research. And I actually was also asked to assume responsibility for registration for the Office of Registrar. That since has moved back to the provost. . . . our Dean of Students resigned suddenly in December and I was asked to assume an intramural as Dean of Students. . . . CIO's have a tendency to know their institution probably as well as nearly anyone because of their broad swath that we really cut across the institution."

Implementer (Focus on ensuring technology development and support projects are completed successfully.)

> "I actually provided a monthly stop light report along or I would say maybe 12 categories . . . Time, money, um, I don't remember all the categories . . . so he

> [board member] walked with us through this entire implementation . . . When we finished this implementation, the Board of Regents wrote a resolution, if you will, recognizing this team for the work that they did."

IT Division Role:

Functional Support (Provide technology development and support to help faculty, staff, and students do their work.)

> "[IT] really is a foundation. It's one of those foundations of service and support that cut across the entire community here. Anything involving computers, technology on the academic side, on the administrative side, on the service side. These are the men and women that provide that service

Operations Improvement (Identify and provide technology solutions that help the faculty, staff, and students do their work better.)

> "Administrative systems here were an in-house developed system that was originally developed for a Unix mainframe and then over the course of 5 years literally ported screen by screen to this system. No modifications. No business practice of review. Simply a screen per screen movement or migration. When I came in and the president at the time said to me, "Well, what do you think?" and I said, "Well, look at it this way. You went from here to here and it took you 5 years to do it," and that's, in essence, what they did. The level of satisfaction was near zero. . . . So we began that implementation. We did a formal request for proposals. We looked carefully at 2 particular systems and SunGard banner was the selected system. . . . The old system also wasn't integrated so name and

> address were multiple times could've been different. It was just an absolute nightmare from a data management perspective and a data use perspective. . . . You know, we need to really keep in mind that the value of these systems is really on the back end as much as it is on the front end, and the value of that system on the back end was zero. So that was an essential component that for this college to, quite frankly, just survive in terms of understanding its finances, understanding its gifts, donations, endowment, understanding the student process. They were still doing paper registrations here 3 years ago. It was not online."

Implementation Approaches:

Collaborative (What is done is determined jointly by a group of people involved with or who have a stake in the project.)

> "Well, we believe that – I believe, I'll personalize it – that functional users have to own these systems. And one thing we did, we, in essence, distributed our system analyst out to those functional areas. So the functional areas set priorities for technical work. We coordinate that. We have a directive enterprise sys admin who has to coordinate that, but, by and large, the priorities are set by the customer, if you will, and that has helped a lot."

Persuasive (A person drives decision-making by persuading others to share his/her viewpoint.)

> "Well, as I've mentioned, we had a consultant. The consultant made a proposal. I reformatted that proposal into a presentation for the cabinet and we had a couple

of options including doing continuing to do what we were doing. And they agreed with my recommendation and we moved to that system."

Y5

Background:

You have been at the institution for 3 years, coming to your alma mater from a large corporate organization. You have found many of the same communications issues from a large corporation are present in a small college. You are the Director of IT and have only been on the cabinet for 8 months, after a new president arrived and changed the leadership team structure. The IT Division has 10 people.

Leadership Team Presence:

You believe that many decisions made by the leadership team are influenced by technology, and that being on the team allows you to know better what is happening. You suspect it will be easier to make pitches for projects now that you are a member of the leadership team. Membership on the leadership is symbol of the value the president places on technology, and you feel who the president is makes a bigger difference than whether the CIO is on the leadership team.

The following sections attempt to identify tendencies in how the CIO and division roles function as well as how technology projects are implemented and decisions made. Again, these are not intended to be comprehensive but rather to represent some trends in what happens at your institution. The quotations are example comments from the transcript of our interview intended to illustrate the identified trend.

CIO Role:

Implementer (Focus on ensuring technology development and support projects are completed successfully.)

> "We've identified what we want to do in terms of there were several choices for VoIP that we shopped around with. We have made a choice on a system. We've spec'd out one of the hardest things for us to actually do with our old phone system was essentially what we called an instrument count. Where are all of the phones? What are the extensions that ring to them? Do we need the ones that are there? What do we want to do about phones in the dorms? Since they are all analogued, do we want to put a VoIP phone in every dorm room, or do we want to convert those so that they're still analogued. All those decisions, and, uh, all those things that had to be done up front have been completed. We've identified all those and got all that scoped out. And, so we're ready now, and now it is essentially a planning of the timeline of work and when to start that and how that will overlap other things that we'll be doing. So that, having all that, all those questions took quite a bit of time to answer and to flush out."

Manager (Focus on providing oversight for a team of people who provide technology development and support.)

> "Well, we for example, we were a Novell shop for many years. And, we relied on external consultants to deal with Novell because, frankly, we didn't have the skills on staff to deal with it. And, so as we looked to transition away from Novell and go to other, you know, systems, other back end platforms, we made choices based

> on, you know, I mean we went with back up directory and Windows based storage and Unix, some Unix based file systems. Um, but we did have those skills on staff. Had we not, I would have hired them. There were many situations with some of those older platforms that it was cumbersome and frustrating to have to rely on a vendor to help us with day to day operations."

IT Division Role:

Functional Support (Provide technology development and support to help faculty, staff, and students do their work.)

> "if it had buttons, we'd deal with it . . . we cover everything from you would, I guess, imagine out of the gate for IT—networks, servers, uh, desktops, things like that, all the way to wiring card swipes, um, phone systems, and we run a pretty thorough help desk. And, what I mean by that is we offer to students help desk assistance, with, um, software issues, virus problems, um, we, obviously we do that for staff and for faculty as well to keep them up and running. But, we tackle a whole, we wear a lot of hats is the best way I can describe what we cover, every technology role on campus. There's nothing that we don't oversee in some way."

Operations Improvement (Identify and provide technology solutions that help the faculty, staff, and students do their work better.)

> "The president is actually very technology friendly, and it is very much about key metrics and some of the things that are cumbersome for us to do with our enterprise system today . . . So, that one [upgrading administrative software systems], actually it's again something we wanted to do, but he was very much on

board with. And, I would probably echo that for the majority of the cabinet members I think everyone sees a need in some way for us to need to make those changes in order to do reporting and things more efficiently, to have dashboards, if you will and things like that."

Implementation Approaches:

Technical (Decision-making is focused on technical drivers.)

"We've identified what we want to do in terms of there were several choices for VoIP that we shopped around with. We have made a choice on a system. We've spec'ed it out. One of the hardest things for us to actually do with our old phone system was essentially what we called an instrument count. Where are all of the phones? What are the extensions that ring to them? Do we need the ones that are there? What do we want to do about phones in the dorms? Since they are all analogued, do we want to put a VoIP phone in every dorm room, or do we want to convert those so that they're still analogued. All those decisions, and, uh, all those things that had to be done up front have been completed. We've identified all those and got all that scoped out. And, so we're ready now, and now it is essentially a planning of the timeline of work and when to start that and how that will overlap other things that we'll be doing. So that, having all that, allthose questions took quite a bit of time to answer and to flush out."

Bottom-Up (A position lower in organizational hierarchy makes decisions and convinces positions higher in organizational hierarchy what should be done.)

> "[We identify what projects get done for the college] through the capital planning process that we go through at the end of a calendar year. Generally have a decent idea of things coming up in terms of, again, I'll use the example of the phone system. It is aged to the point where we need to decide what we want to do in terms of upgrading it, dropping maintenance on it, replacing it. We keep a pretty good inventory and track on that kind of stuff. So, for starters, we look at, okay what has to absolutely be upgraded? . . . And then, we go to the okay, what would be nice to do. SIM clients was one of those. . . . And so, we go through the must haves, needs to be upgraded, and that includes faculty staff desktops, combing over our inventory as part of that process, to look at what's aged over a certain period. We have a standard, what we call, refresh period of four years. So, we'll look at part of that process, okay, who has a machine that is going to be four years old this coming year? And, what kind of shape is it in, and are they happy with it. Can they last one more year? We come up with a list of things that we need to replace. That's probably the best of it."

Y6

Background:

Early in your career, you worked for a technology startup and developed technology experience. You then pursued a faculty role and retain a faculty title, although it is now difficult to find time to teach. When considering another opportunity, you were offered the chance to serve as director of instructional design and technology. About four years ago, you were then asked to serve as CIO and have since been adding administrative

responsibilities. One of these new responsibilities is Dean of Information and Learning Management (the title is about to change to Associate Provost), where you are responsible for the library, registrar's office, institutional research, and instructional design and technology. You have a dual reporting role, with CIO reporting to president and Dean to Provost. The IT Division has 8 people.

Leadership Team Presence:

You believe being on the leadership team helps people avoid making decisions in insular ways without considering impact across campus and can help ensure consensus. Although not seeking consensus and different viewpoints could provide a short tem increase in the speed of implementing projects, the institution would suffer in the long run.

The following sections attempt to identify tendencies in how the CIO and division roles function as well as how technology projects are implemented and decisions made. Again, these are not intended to be comprehensive but rather to represent some trends in what happens at your institution. The quotations are example comments from the transcript of our interview intended to illustrate the identified trend.

CIO Role:

Strategist (Focus on how efforts and projects fit within the larger organization, considering long term operations management and achievement of mission.)

> "I'm actually just about to become the associate provost here as well, so my title probably sometime next week will be associate provost and chief information officer, and in that role I will be really, I, I—what I see happening here is that

> uhm, technology is, and academic affairs are being given a more central role at the college, instead of being a peripheral"

Manager (Focus on providing oversight for a team of people who provide technology development and support.)

> "I've been building up my staff so that I can have uhm, I have two directors and I will now have three who report to me, and I give them responsibility for the day-to-day work and technology and I review, I coordinate with them, I support them where they need to. But they're very capable, so I will be not so much involved in day-to-day functioning of technology but I will be doing the uhm, the long-term planning and the review of policy and the review of uhm, of assessment, things like these."

IT Division Role:

Operations Improvement (Identify and provide technology solutions that help the faculty, staff, and students do their work better.)

> "Mainly what I've done in the last four years or so has been to upgrade most of the campus technology. Uhm, we did a major—we completely swiped out all the network switches on campus in December of '08 and we have—we uhm, we've upgraded all of the wireless hubs on campus. We've changed all of the campus computer labs to do dual-boot Macs so that people can work either on a Mac side or on the Windows side. Uhm, we have a faculty laptop program where every three years, faculty get a new laptop and we're just implementing a staff replacement cycle. In the past, staff who complained got new computers and staff

who were polite just gets their old computer until they finally said ‘I can’t do my work anymore. ’We’re upgrading that. We have privacy policies and security policies that are being put in place. Uhm, we have uh, we, we had horrible physical protection for our network servers, and now all of our network servers have physical protection around them that it keeps them from being tampered with as well as software protection that hopefully keeps us at least some, from the attacks at the college.”

Innovation (Provide technology solutions that help the institution provide new approaches to achieving its mission or be consider by peers as an innovative institution.)

“for a brief time we had great notoriety and the board I think wanted to start recapturing some of that. So, part of my role—part of my uh, operating procedures has been to collaborate with our vendors to build case studies that showcase the college, showcase the vendor and give us both something that we can take out and say ‘See, here’s what we’re doing that’s exciting. ’I take it to my board, they take it to their customers, and works very well. It’s a win-win for both of us.”

Implementation Approaches:

Collaborative (What is done is determined jointly by a group of people involved with or who have a stake in the project.)

“We have a committee—a campus-wide committee called ISAC, Information Services Advisory Committee. And I chair that committee that has appointed rep—a representative that’s appointed by each unit—one from student affairs, one

from each of the academic schools, one from the business office, one from uh institutional advancement, one from the uh, admissions. And each of these reps comes to the monthly meetings and we talk about what the proposed projects are. I will bring in, and, and some of the other information services staff will bring in information about our projects and then uhm, we take our budget and we take requests from all of the units. The units send the requests to the representatives. The representatives fill out budget request, and then we have a series of extensive meetings where we, as a small group, go through the budget request and behind closed doors, rank the relative merits of each request based on how they feed into or don't feed into the college's strategic goals. . . . So there's a very strong collaborative sense in this group. And then I will take those recommendations to the administrative council and, or sometimes you know, recommendations come from administrative council and I'll take it back to ISAC and then through this back and forth process, we come up with a proposed budget which is approved by the administrative council, and then reviewed very briefly by the Board of Trustees. Uhm, and then we, we move ahead with those projects."

Strategic (Decision-making is focused on business processes and organizational drivers.)

"It can't be done without thinking about—decisions can't be made without thinking about their impact on academic affairs, and they have been in the past."