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A Study of the Extent to Which Institutional Strategic Planning Serves as a Guide for Technology Planning in Tennessee Board of Regents Institutions.

Evelyn Leonhardt Fox
East Tennessee State University

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Evelyn L. Fox
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Dr. Terrence Tollefson, Chair
Dr. Louise MacKay
Dr. Russell Mays
Dr. Terry Countermine

ABSTRACT

A Study of the Extent to Which Institutional
Strategic Planning Serves as a Guide
for Technology Planning in Tennessee Board of Regents Institutions

by

Evelyn L. Fox

Literature indicates that strategic planning is an effective method for serving as a basis for technology planning. Strategic planning calls for the description of resources needed to support the goals and objectives of the plan. From these descriptions, technology planners may develop a technology plan.

This study sought to determine, in Tennessee Board of Regents (TBR) institutions, the extent to which strategic planning served as a guide for technology planning. In a quantitative survey administered online to 150 invited participants, 92 or 61% responded. Results indicated that TBR schools valued the strategic plan as a method of communicating technology needs. Demographic data collected indicated that there were little to no differences among respondents from two or four years schools or between or among respondents holding different job titles with regard to the value of the strategic plan as a technology planning guide.

The study invited open-ended comments for each closed-ended question asked. The questions and comments led to the following conclusions.

1. The budget drives the planning process. Plans are made and priorities set. At budget time, money for technology may be cut, but very little change in goals takes place.

2. The planning process or results of the planning process do not permeate to every level in institutions.

3. Chief information officers know more about strategic planning than chief academic officers or deans/directors/coordinators know about the technology planning process.

DEDICATION

This dissertation is dedicated to my husband, Albert, whose support has been constant in an ever-changing world.

ACKNOWLEDGEMENTS

This dissertation was completed as a distance-education endeavor. All communication, except for the final defense, was done via electronic mail, by fax, by telephone, or by presentation across the Internet. I owe a tremendous debt of gratitude to Dr. Terrence Tollefson who patiently served as my chair for this undertaking. He was always there to offer valuable critique, judicious advice, and much-needed encouragement. I am grateful, also, for the support of my committee members Dr. Louise MacKay, Dr. Russell Mays, and Dr. Terry Countermine for the work they have done in helping this project become a reality.

An especially effective pilot group assisted me in "ironing out" the problems with the online survey. In particular, I would like to thank Dr. Cynthia Burnley at East Tennessee State University for her unceasing efforts to help me not only develop the survey but to track down the last elusive bug in order to make it a success.

And finally, to the future Dr. Gerard O'Leary Farley, I would like to express special thanks for always being able to make me laugh.

Drs. Tollefson, MacKay, Fox, Mays and Countermine
March 21, 2002

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CHAPTER 1

INTRODUCTION

Education is in the midst of a revolution so sweeping that it is difficult even for professionals to understand and manage. That revolution is two-fold. On the one hand, the social order is undergoing a socioeconomic change that is affecting education itself. Family units can no longer be counted upon to be single, self-sustaining units, but are more and more frequently composed of single fathers living apart from single mothers. Cook (1995) reported that the nuclear family of father, mother, and children accounted for a scant seven percent of the population and that the Internal Revenue Service recognized "…at least thirteen variations in the family" (p. 9). At about the same time, Merriam and Cafferella (1999) reported that those adults were returning to school in record numbers because "…education is usually a form of social intervention that often begins with a problem that needs to be solved" (p. 75).

The population of the U.S. is aging and living longer as well. People are returning to school to train for second careers. Educators are finding that educating or re-educating adults is very different from educating younger first-time collegians. They are finding that older adults want to have a say in what they do. This has placed a burden upon institutional leaders to re-think the ways they educate (Merriam & Cafferella, 1999).

Additionally, institutional activities are under-funded to an alarming degree. Not only must institutional leaders cope with a differing and more demanding public, they must do it on tighter budgets. They are forced to be creative at a time when it is difficult to feel creative, because a major concern for each of them is to plot a course for their respective institutions on the limited funds available. Institutional leaders are being called upon to create a new paradigm to handle this problem (Duderstadt, 1999).

The second chapter of the revolution pertinent to this research deals with the change that has occurred with regard to technology. It is being adopted at an accelerating rate in education and has made a remarkable impact. Cook (1995) stated that it was a phenomenon that would

"…forever change every aspect of education – its structure, content, delivery, even its basic purpose" (p. 15).

Technology has been responsible for pervasive change. Though a definition of technology is more inclusive than that of computers, computers are of sufficient scope within technology to represent the term for illustration. Computers have been used from the mid 20th century forward to manage information and, as a result, they have ushered in an information age that is characterized by systems thinking, globalization, and obsolescence (Cook, 1995).

Systems thinking is a way of expressing connectivity. Today, one can connect to the world through the Internet, where vast resources of information are available. New communication channels are available through electronic mail where one may not only communicate with friends, but also may conduct most business online. Systems thinking has provided for globalization by connecting the world through technology. Again, because of technology, the information available and the effects it produces echo around the world for all to share – and most markedly for everyone to comment upon.

Technology has become integral to educational institutions. Cases abound in the literature citing its contribution to the solutions of specific problems being faced. A library has a new cataloguing procedure. A college has a new registration system. The course catalog is put online. Many educators would argue that technology is an indispensable part of the dissemination of knowledge. It has become a resource that cannot be ignored.

Rowley, Lujan, & Dolence, (1997) stated,

> "Ignoring technology will not reduce its impact or cause it to fail or cause it to go away. Ignoring technology will only prove to our prospective students, our funding agencies, our partner schools that we are obsolete and disconnected from their reality. The scenario of rejecting technology results in our demise" (p. 10).

Of secondary importance is that technology itself is undergoing rapid change. The change is so fast that, literally, what is acquired today may be obsolete tomorrow. Immutability has given way to transience (Cook, 1995), which has led to a feeling of unsettledness.

A glance at the references cited in this paper immediately yields two with titles that provide an instant identification of the perceived difficulty in accommodating these changes. Those two are Ringle and Updegrove's "Is strategic planning for technology an oxymoron?" (1998) and Katz's *Dancing with the devil* (1999), both of which consider the dual dilemmas posed by changes brought by technology and the swiftly changing face of technology.

Adapting to change in its many forms is a significant problem facing today's institutions. They must deal with changing socioeconomic conditions that place new demands upon them. At the same time, they must deal with the integration of technology into education while coming to grips with the inherent conditions stated above.

The central predicament seems to be how to proceed with the integration of technology into education so that it becomes an aid in dealing with socioeconomic change. Again and again, technological systems are being used to streamline existing processes rather than engineer new ones. There is scant evidence to support the notion that technology is being used to help institutions deal with the socioeconomic change that is affecting them. "The basic problem is that, so far, computers and their kin have been used to formalize, perhaps even fossilize, traditional thinking processes, not to engender new ones" (Cook, 1995, p.16).

The answer lies in strategic planning. Both socioeconomic change and technological change may be accommodated, because strategic planning can be a channel through which change may be funneled in order to produce desired outcomes (Bryson, 1995; Cook, 1995). For technology planners, it is through strategic planning that institutional leaders may "…concentrate the use of resources and to focus on priorities in their use" (Dodd cited in Rowley, Lujan, & Dolence, 1997, p. 9).

Strategic planning may be thought of as a means of drawing a picture of the future and developing the structure to achieve it. It was, stated Bryson (1995), "…a disciplined effort to produce fundamental decisions and actions that shape and guide what an organization is, what it does, and why it does it" (p. 4). Institutional leaders must assess external and internal environments of the institution in order to determine strengths and weaknesses. They must

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explain how they prescribe the business of the institution by documenting business processes, then setting mission, goals and action plans to achieve what they wish it to become and how processes should change as a result.

Additionally, educational leaders must attend to the planning for technology as well. Precisely how planning for technology is actually accomplished is a matter of institutional preference. But central to its notion is that technology should "…contribute to the mission of an institution, and not just make it more expensive to run" (Layton, 1989, p. 2). If that is to occur, some means of communicating technology needs must be in place. The strategic planning document becomes the ideal basis for communication, for it serves not only as a statement of institutional purpose, but it also is developed from supporting documents of assessments and current business processes that describe in some detail where the institution stands with regard to its resources.

Statement of the Problem

This quantitative study is designed to determine the answer to the question regarding the degree to which strategic planning documents, in conjunction with supporting documentation developed in Tennessee Board of Regents' schools, provide the foundation for technology planning. Educators and administrators at the nineteen institutions of higher learning that form the Tennessee Board of Regents (TBR) system all engage in strategic planning. It is mandated at the governing-board level (TBR, 1999). They also engage in strategic planning for technology, again mandated by the governing body. Exactly how do they determine what to include in the technology planning document? How do they know with any accuracy the technology needed in order to fulfill the respective visions and missions that have been set forth? The purpose of this study is to ascertain whether the institutional strategic plan, with its supporting documentation of needs assessments and current business processes, is used collectively as a vehicle for communicating technological needs in the nineteen TBR institutions.

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Research Questions

Seventeen research questions have been formulated to test the general problem statement of the degree to which TBR institutions use the institutional strategic plan as a means of communicating technology needs:

1. To what extent is the strategic planning document helpful in achieving the institutional vision? Please choose only one.

2. How often is technology used as a strategy for achieving institutional goals? Please choose only one.

3. How often is technology acknowledged in the strategic plan and/or its supporting documentation as supporting goals of the institution? Please choose only one.

4. How often is technology specifically cited as a strategy for implementing business processes identified in the strategic plan and/or its supporting documentation? (A business process describes how a procedure is carried out such as enrolling a student, checking out a library book, determining financial aid, awarding financial aid, developing curriculum, and the like.) Please choose only one.

5. Does the strategic plan and/or its supporting documentation specify that a technology access fee be used as a strategy for acquiring technology toward the implementation of strategic goals? Please choose only one.

6. What is the extent to which the information technology plan is aligned with the institutional strategic plan at your institution?

7. In the past year why was technology purchased?

8. At what point in the strategic planning process are technology needs generally considered?

9. During the strategic planning process what is the primary way of determining technology resources needed to accomplish the plan?

10. To what extent is the office of information technology relied upon for guidance in helping determine how technology could be used as a strategy to accomplish planning goals?

11. To what extent does the office of information technology provide input during the strategic planning process that will help determine the strategies used in accomplishing the goals stated in the institutional strategic plan?

12. Is the office of chief information officer represented on the strategic planning committee either as a voting or non-voting member?

13. How often is the strategic planning document and/or its supporting documentation used as a vehicle for communicating the technology needs of the institution?

14. At your institution, to what extent is the strategic plan and/or its supporting documentation helpful in aiding information technology to develop its goals?

15. How often is the institutional strategic plan and/or its supporting documentation used for guidance in determining what to include in the institutional technology plan?

16. To what extent is the office of information technology advised about the goals of the institution stated in the institutional strategic plan?

17. Is the office of chief academic officer represented on the information technology planning committee either as a voting or non-voting member?

<u>Assumptions</u>

Though there are many types of planning that can occur, the TBR identifies planning in which member institutions must participate as strategic planning. This study assumes that because documents from TBR institutions say strategic planning is being conducted at the respective institutions, it is, in fact, strategic planning that is being done. This implies that institutional leaders are familiar with the processes and attending vocabulary of strategic planning.

Significance of the Study

There is an abundance of literature dealing with institutional strategic planning and technology planning. Most strategic planning authors contend that strategic planning is a way of accommodating change, including technological change, but say little about how strategic plans can be used to convey intent for technological resources. What little information there is on the subject is confined to technology planning literature. In other words, there is very little published on the significance of aligning the two. This study will contribute to the body of literature that has not addressed the alignment of technology planning goals with strategic planning goals.

In addition, the TBR has required that its institutions participate in strategic planning. Given the magnitude of the amount of time and effort involved in strategic planning, it would be useful to determine its strengths and shortcomings. This study may be used to improve the effectiveness of spending such a sum of money. It is significant in that it will reveal whether the TBR schools use strategic planning as a way to convey technology resource needs.

Limitations and Delimitations

Strategic planning is largely a qualitative process. Though the literature speaks of strategic planning as incorporating vision, mission and goals of an institution, it also is quite specific that people develop those components and that strategic planning is, therefore, a "people" process (Bryson, 1995; Cook, 1995). That is, precisely who serves on the strategic planning committees and what input will eventually evolve into "The Plan" are largely institution-specific. Qualitative studies capture the nuances of what happens, the interactions that occur and the compromises that are made that will eventually result in planning documents. Quantitative studies can be more limited in this regard as they traditionally limit the degree to which respondents can candidly describe their experiences. It is for this reason that open-ended questions have been added to each quantitative question on the survey. They are provided so that respondents will have an opportunity to expresses those nuances generally available only

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through qualitative methods. The final question of the survey will be one that requests respondents to provide any additional information that they believe will be pertinent to the study.

Additionally, the population and sample used for this study is limited to TBR institutions and may not be generalized appropriately to any other population. It may also be limited in TBR institutions if there are insufficient numbers of responses to the survey.

This quantitative study will contribute statistics and data that are as independent of both researcher and respondent biases to the extent possible. They will allow results of a study to be presented independently of individual interpretation (Gall, Borg, & Gall, 1996). This study should effectively answer the question, "To what degree does an institution use its strategic planning document as a method of communicating technology needs?"

Definition of Terms

Technology

The term, "technology", in this research is used synonymously with information technology in the literature. It refers to any technology that accesses, moves, stores, and/or manages information (Boar, 1993; Rowley, Lujan, & Dolence, 1997). As such, it encompasses any hardware used in accessing the Internet in all of its forms, computers and their peripherals, copying machines and telephones and telephone systems.

Alignment

> "Alignment" refers to consistency of plans, processes, information, resource decisions, actions, results, analysis, and learning to support key organization-wide goals. Effective alignment requires common understanding of purposes and goals and use of complementary measures and information for planning, tracking, analysis, and improvement at three levels: the organizational/senior leader level; the key process level; and the program, school, class, or individual level (National Institute of Standards and Technology, 2001, p. 34).

Strategic Planning

Cook (1995) defined strategic planning as a way of managing change. This definition encompasses the dual ideas of using strategic planning as a method for handling the change and of forcing change upon the institution in order to accommodate and adapt to what is happening to their environments.

Bryson (1995) stated the definition of strategic planning as "…a disciplined effort to produce fundamental decisions and actions that shape and guide what an organization is, what it does, and why it does it" (p. 4). Coleman (cited in Vandament, 1986) stated, "Planning is an effort to determine and control the destiny of an institution" (p. 58). These definitions speak to the idea of grasping the change that is occurring in the environment and then making an effort to control it for the institution's good.

Strategic planning is essentially the determination by leaders of an enterprise to draw a picture of what they would like the organization to become, perform an environmental scan on resources it has or must acquire to become what they have envisioned, then formulate actions that will provide a pathway to the envisioned future. It is, fundamentally, a statement of belief that an institution can shape its own destiny by controlling the change it encounters daily. With that in mind, it is easier to understand the almost poetic definitions of strategic planning one finds in the literature. It is "…a path to excellence" (Cook, 1995, p 35). It is also a way to "…make decisions about the future before the future either forces the decisions or renders any decisions irrelevant" (Cook, p. 46). It is the "means by which an organization continually re-creates itself toward excellence" (Cook, p. 41). It has served as one of the "energizing forces for major change" and, in some cases as an attempt to "alter the character of the university" Schmidtlein and Milton (1990, p. 2). It can also "…prompt in organizations the kind of imagination – and commitment – that psychotherapist and theologian Thomas Moore thinks are necessary to deal with individuals' life conundrums" Bryson (1995, p. 5).

<u>Technology Planning</u>

Cassidy (1998) stated that technology planning was done in order to effectively manage a critical asset; improve communications between the office of information technology and the rest of the enterprise; link the technology resources to the mission, vision, and goals of the enterprise; plan the flow of information and processes; and allocate information technology resources.   She stated that it should involve the entire enterprise and not just the technology professionals.

<u>Vision, Mission, Goals, Strategies, Action Plans</u>

Vision, mission, goals, strategies, and action plans are all components of a strategic plan. Vision describes where the institution is headed, mission describes what the institution does on a daily basis that takes it toward a vision; goals are statements of broad actions to be taken to implement the vision and mission and strategies are approaches taken by different parts of institutions to accomplish the broad goals. (Bryson, 1995; Cook, 1995).

<div align="center"><u>Overview of Study</u></div>

This research is grounded in the themes of the literature reviewed in Chapter 2. Those are: (a) rapid change, including changes in technology, is forcing higher education leaders to re-think how they conduct business; (b) institutional strategic planning is a tool for managing change; (c) technology needs can be communicated by means of the institutional strategic plan; and (d) technology planning should be aligned with the institutional strategic plan (Boar, 1994; Bryson, 1995; Cassidy, 1998; Cook, 1995; Merriam & Cafferella, 1999; Schmidtlein & Milton, 1990; Smith, Lewis, & Massey, 2000).

Chapter 3 describes a three-phase methodology used in the study. In phase one, a questionnaire was developed that was sent to all TBR schools. Recipients at each institution were the chief academic officer, the chief information officer and the deans/directors of the

academic units as defined by the institution. The questionnaire was developed with assistance from four higher education officials who have knowledge of and have participated in strategic planning at their respective institutions. In phase two, a doctoral research class and three academic deans pilot-tested the questionnaire. Their reviews were used to determine the final form of the questionnaire. Phase three was the distribution of the questionnaire.

Chapter 4 describes the results of the study. Chapter 5 presents conclusions and recommendations of the study for further research and to improve practice.

CHAPTER 2

REVIEW OF LITERATURE

<u>Introduction</u>

Information technology, although not always known by that name, has made significant inroads into society since the creation in 1947 at the University of Pennsylvania of the ENIAC computer. Nasseh (2000) stated, rather strongly, that there has been nothing else in the history of humankind that has made such an impact as the Internet and its enabler, computer technology. And now, after almost two decades of technology use in higher education, its use has become common in support of both administrative and academic endeavors (Heckman & Maswich, 2000).

The advent of information technology has caused sweeping changes. These changes include the timeliness of information delivery, a determination of what is delivered, and to whom, as well as a redefinition of the structure and purposes of the uses of information. Changes in information technology have occurred to such a degree that the era has been christened the "information age" (Cook, 1995, p. 25; Duderstadt, 1999, p. 1; Jonscher, 1999, p. 32; Merriam & Cafferella, 1999, p. 15). They have caused new developments that have opened new possibilities and are causing, in many cases, a re-structuring of society (Edirisooriya, 2000). It has also been a catalyst for change, "…reacting with other elements in a system to spark a reaction and a change in form and structure" (Smith, Lewis, & Massey, 2000, p. 34).

If this change is to be accommodated, some process or plan must be instituted to take advantage of and capture its positive aspects. What better place than through strategic planning, which is described as a way to manage change (Bryson, 1995; Cook, 1995)? With 90% of the 150 technology officers in higher education nation-wide surveyed engaging in strategic planning for technology (Ringle & Updegrove, 1998), this type of planning for technology would seem a logical place to start. Literature, however, indicates that a larger picture must first be drawn. It is not that technology planning should not be undertaken. Instead what must happen for technology planning to be successful is that it must follow institutional strategic planning and be aligned with the goals established therein (Boar, 1993; Boar, 1994; Cassidy, 1998; Ringle & Updegrove, 1998; Schmidtlein & Milton, 1990; The University of Memphis Information Technology Strategic Plan, 2001; NIST, 2001).

This chapter will explore the literature with regard to these concepts. Major sections include The Impact of Technology; Managing Change Through Strategic Planning, Why Institutions Plan, Elements of Strategic Planning, and Alignment of Technology Planning with Institutional Strategic Planning.

Journal articles, books, Internet web pages, and strategic plans for both the institutional and technology planning were examined in order to conduct this review. A literature search conducted by an East Tennessee State University librarian was also employed. The ERIC database was searched for journal articles and digests that might contribute to the research. A search through dissertation abstracts was conducted with only one found to be pertinent to this study.

The idea of using the institutional strategic plan as a communications device for determining institutional technology needs that can be expressed in the technology strategic plan (expressed as the alignment of the technology plan with institutional goals) is a fairly recent idea for higher education. As a result, few higher education references were found. Some of the literature for this section has been taken from the business sector.

<u>The Impact of Technology</u>

The first connectivity for use of communication in higher education began with the project entitled ARPANET in 1969, which is the acknowledged forerunner of the Internet. ARPANET operated between and among the University of California-Los Angeles, Stanford Research Institute and the University of California-Santa Barbara. In 1973, it was expanded to include the European theater when the University College of London and the Royal Radar Establishment in Norway became part of ARPANET. By 1970, most research universities were using mainframes for administrative purposes, research, and the teaching of computer science. In the 1980s, with the advent of personal computers, information technology became available to students, faculty and staff. The World Wide Web was conceived in 1992 and is now widely used in education as a research tool and as a medium for course offerings and communication in general.

Today, the use of technology in higher education is a given. Even a brief survey of the literature indicates that it has been one of the most prevalent developments (Milliron & Miles, 1998) in higher education and that it is, in fact, transforming the educational enterprise (Gay &

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Tammy, 1999; Milliron & Miles).   Milliron and Miles foresaw that the use of information technology would be a focal point for educators in coming years. Cook (1995) stated that public education could only compete in a free market through, among other things, the use of technology.

One of the early driving forces for technology use in education has been the creation of a national technology plan entitled "Getting America's students ready for the 21st century" (Smith, 2000). While it was aimed at elementary and secondary schools, it has had an impact upon higher education. In order to prepare the elementary and secondary students in the use of technology, teachers must be trained in their education classes to carry out the job of student training. Adding to this belief is another belief that the trained students enter college as technologically literate. Such students reportedly expect technology to be a part of the college experience and expect college professors to be as literate as they.

The result of the abundant use of technology is that the vision for teaching and learning has altered. The current model of education is said to be changing (Berge, 2000). An example of the changing model is that of asynchronous distance education, a teaching delivery system that is defined as being independent of time and space. In other words, students may learn where they wish and at times that are convenient to them. An early example of asynchronous learning using technology was Pennsylvania State University's World Campus. As early as 1992, the university identified as a major goal the use of information technology to provide access to students worldwide (Ruben & Lehr, 1997).   Today, many institutions of higher learning engage in various forms of technology-driven distance education.

Other institutions have used technology in their efforts to stay current and to be competitive. As an example, one university encourages the creation of a personal homepage for every student and faculty member and a course web site for every individual and every course section. (Jafari, 2000) Elsewhere, students have kept electronic notebooks and have engaged in the exchange of electronic mail with instructors (McMullen, Goldbaum, & Sattler, 1998). New databases have been created to simplify the work of entering student information and of tracking students across several campuses (Ryan & Miller, 2000).   There are so many specific applications that it seems more appropriate, or perhaps manageable, to speak of groups or types of applications. Milliron and Miles (1998) identified six major areas for the use of technology that address the different ways instruction is delivered: technology for student application and

production, technology for student-driven learning, technology for presentation, technology tools to improve communication, applications of technology for research and reference, and course management and assessment technologies.

Technologists themselves have made every effort to keep technology current so that learning can occur for everyone. The World Wide Web Consortium has identified standards that should be built into to software to serve as accessibility features for all, including the disabled, so that access would always be available (Burgstahler, 2000). As an example, adherence to these standards allows computer add-ons, such as speech devices for the visually impaired, to be able to function so as to interpret orally what users cannot see.

Why this compelling urge or need to use technology? After all, there are many widely recognized problems associated with it that nearly everyone will recognize. Benamati and Singh (1998) identified nine categories of needs associated with its use: (a) training demands; (b) errors with equipment and software; (c) vendor oversell; (d) new integration into older architecture; (e) the burden of support; (f) resistance to its use; (g) acquisition dilemmas; (h) vendor neglect or abandonment of support; and (i) cascading needs, where the purchase of one leads to the need to purchase another. And Cook (1995) pronounced the information age as one in which there is a constant reordering so that we are experiencing "permanent impermanence" (p. 26). The answer to the foregoing question seems to lie in the fact that the new technology has changed us forever and that we must employ it to become competitive. NIST (2001) has stated that "…changes in technology and in the national and world economies are creating increasing demands on employees to become knowledge workers and problem solvers, keeping pace with the rapid market changes" (p. 1).

<u>Managing Change Through Strategic Planning</u>

<u>Why Institutions Plan</u>

As noted, my literature review has indicated that numerous organizations have used planning as a change management tool. Just as change can take many forms, so do the labels that describe it. Within institutions there may be a need to resolve pressing internal problems or to accommodate environmental changes (Berge, 2000; Cook, 1995; Schmidtlein & Milton, 1990). Cook (1995) identified four such environmental changes most affecting public education that must be accommodated: the unprecedented demographic shifts and reformations,

the recent transitions of the nation's economy from agriculture and manufacturing to information and now to bio-genetics, the corresponding transitions in mainstream personal values, and the intensification of global competition and consequent redefinition of excellence. To these four, others can be added: to control costs, to react to a demanding and selective population, to deal with governmental constraints on actions, to be competitive with like organizations, to ensure quality, or to react to concerns for the environment (Boar, 1993).

These citations speak to changes that are occurring outside institutions of higher learning and may not be significantly felt internally. But Smith (2000), citing Gilbert's study, noted that faculty members were noticing internal or grassroots changes that affected how they taught. Specifically noted were: faculty reported that their best teaching efforts were not as effective with current students as they had been in the past; one-third of all college students did not purchase the requisite textbooks; more and more students were technologically literate such that, by 1995, over 50% of all freshmen had used technology as a method of accomplishing school work; somewhere between 5% and 15% percent of faculty members reported that using technology in teaching had helped them to be more effective teachers; students were voluntarily voting to be assessed fees of up to $150 each to subsidize computer-related purchases and services; and finally, more and more faculty members were developing customized course packs for the Internet or with textbook publishers.

Information technology also has affected administrative services. Databases hold information about students, faculty, staff, administration, and alumni. These databases are manipulated in a variety of ways and provide information in almost any format at almost any time that can be imagined. Electronic mail and complex computer and telecommunication systems give campus groups the ability to communicate, collaborate, and coordinate "…beyond the limitation of time and space" (Heckman & Maswich, 2000, p. 158).

Planning can also be a way to anticipate and accommodate trends that might affect an institution and its future. As Cook (1995) stated, institutions need to "…make decisions about the future before the future either forces the decisions or renders any decisions irrelevant" (p. 46). The Baldrige criteria for educational excellence, developed by the National Institute of Standards and Technology is an assessment tool to help educational institutions improve their performance and stay abreast of change. The criteria note that an organization's planning

strategy objectives should be based on the anticipation, among other things, of changes such as technological developments and the evolving Internet environment (NIST, 2001).

Institutional leaders left to themselves may elect not to plan at all, but may be under mandates by higher education governing boards to do so. Such mandates are common in higher education. According to Bryson (1995), leaders of an institution should see these mandates as opportunities, for if formulated correctly for and by institutional leaders to their respective constituencies, they help by defining what is not explicitly forbidden. If these are not studied carefully, institutional administrators "…may believe they are more tightly constrained in their actions than they actually are" (Bryson, 1995, p. 26).

Successful planning efforts produce many benefits. Bryson (1995) identified several:

(a) the promotion of strategic thought and action.   Strategic thought is based upon data gathered about the institution. Systematic information gathering will result as a benefit of strategic planning;

(b) improved decision-making. In strategic planning, vital issues and challenges must be identified and planned for; and

(c) improved organizational responsiveness and improved performance. Members of the institution will respond positively to an administration that works toward resolution of the issues facing it.

Elements of Strategic Planning

There are many types of planning. Cook (1995) speaks of five: (a) comprehensive planning, which is limited to planning about what already is; (b) long-range planning, which examines the gaps between what an institution is and what it wishes to become and, without further study, makes adjustments accordingly; (c) program planning, which serves as a way to bring an idea into existence; (d) project planning, which is the identification of a task and the enumeration of the steps needed to accomplish it; and (e) strategic planning, which is the way in which an institution continually responds to change by re-inventing itself to accommodate change.

Although most authors are adamant that strategic planning must evolve from the culture of each institution if it is to succeed, the literature is remarkably consistent in the broad outlines of what constitutes strategic planning. Julia (1996) identified seven basic factors that were

included in the planning process: (a) environmental assessment, (b) institutional assessment, (c) values assessment, (d) program planning, (e) setting goals and objectives, (f) priority setting and resource allocation, and (g) program review. These can be iterative, ongoing, and accomplished in a variety of ways, depending upon the institution, but are most often carried out in the steps of adopting core values; drawing a vision of what the institution is to become; establishing a mission statement describing what the institution is about; identifying strengths and weaknesses (internal assessment) and opportunities and threats (external assessment) that either assist or deter an institution in its achievement of the vision; identifying strategic issues or gaps between where it is and what it wishes to become; formulating strategy to overcome the gaps; and evaluating the process with feedback used as input into the process for its improvement (Boar, 1993; Boar, 1994; Bryson, 1995; Cassidy, 1998; Cook, 1995; NIST, 2001; Schmidtlein & Milton, 1990; Vandament, 1989).

Because the purpose of this study is to determine the extent to which institutions use strategic planning as a vehicle for communicating technology needs, only those functions of the institutional planning cycle in which this typically might occur will be discussed in depth. Those functions are the development of assessments and the formulation of strategy.

Assessments. Assessments, both internal and external are known by many names, including environmental scan, needs assessment, and SWOT. SWOT is an acronym for strengths, weaknesses, opportunities, and threats. Statements of strengths and weaknesses involve the description of the internal environment over which institutional leaders have control. Opportunities and threats pertain to factors in the external environment over which institutional leaders have no control. Both types of assessments serve to determine the current state of the institution's environment and address the idea that an institution's leaders must be aware of the changing environment in which it operates if it is to respond to it effectively (Kotler & Fox, 1995). In addition, assessments provide specific criteria upon which to base decisions by identifying the external threats and opportunities that exist for the institution and then defining the internal strengths and weaknesses that address them (Bryson, 1995; Cook, 1995; Kotler & Fox, 1995; Mecca, 1996; Thomas, 1996). Though these assessments are seldom contained in the final printed strategic plan, they remain an important aspect so that the "…failure to deal with these will severely detract from the validity of the final plan" (Cook, 1995, p. 53).

Applicable to this study is the notion that external assessments explore trends, especially trends in technology (Bryson, 1995; Cook, 1995; Mecca, 1996). Internal assessments include capabilities of resources, and descriptions of business processes that define the activities by which an organization's employees conduct daily activities (Bryson; Cassidy, 1998; Cook).

Because technology plays an increasingly pivotal role in the life of any institution, it becomes imperative that its trends be followed so that advances may be capitalized upon in order to keep the institution current. The problem is that these trends or changes occur at a very rapid rate. Ringle and Updegrove (1998) found that administrators at some institutions had cited this as an excuse for why they did not engage in technology planning at all. Their view was that they simply could not keep up. Cook (1995) provided a solution when he said that institutions must use technology to provide a competitive edge, but that they need not be the first to adopt a new technology simply because it was new. He advised each institution to be the best, but not necessarily the first.

Internal assessments give administrators at institutions a chance to document the current conditions of their resources in relationship to the opportunities and threats discovered by external assessments. Leaders at institutions come away from internal assessments with ideas about where the gaps lie between these internal assessments and the external environmental assessments. If those gaps are not addressed, institutional leaders' ability to contribute toward the realization of the institutions' vision will be compromised, contended Cook (1995).

Business and educational affairs at institutions are conducted via processes whether or not they are formally described.   These are designated as business processes in the literature. They are descriptions of "…who does what to what and when" (Ford et al., 1996, p. 64). The "who" refers to the role or the workgroup involved in the process. The "does what" refers to the set of tasks that comprise the process. The "to what" refers to the business entity or constituency acted upon. The "when " refers to the triggering of the process (Ford et al.). Examples of educational institutional processes include student registration, inter-library loans, awarding of scholarships, awarding of student loans, purchases of equipment, and performance funding procedures. All have incorporated technology as a tool to aid in the achievement of their objectives. When business processes are developed, analyzed, re-engineered, or improved, the resources required to implement the processes must be acknowledged (Bryson, 1995; NIST,

2001). Information technology professionals can then use this information as they formulate

plans for information technology use and support (Cassidy, 1998).

Strategy formulation. The outcomes of the assessments and business process descriptions

provide a compelling rationale for the strategic deployment of resources in an effort to

accommodate findings.   In addition, strategies developed in subsequent strategy formulation

processes are often direct responses to these assessments and descriptions, because they provide

the necessary information about where the institution is weak, where it is strong, what threatens

it, what it can capitalize upon, and how it conducts business (Cook, 1995).

Strategy formulation is the development of goals, strategies, and action plans that address

the identified gap from the assessments between what the institution is and what it wishes to

become.   They describe approaches and actions an institution will undertake in an effort to

narrow the gap (Boar, 1993; Bryson, 1995; Cook, 1995). The differences among them lie in

their varying degrees of specificity.

Goals are grand and overarching. They are broad statements that address the strategic

issues defining what will close the gap between what the institution is and what it wants to be.

They serve as an umbrella for strategies and action plans. They apply to the institution as a

whole. Strategies become more specific than goals by articulating approaches that will be taken

to accomplish a specific goal. There may be several strategies attached to a single goal.

Strategies usually apply to sub-units within an institution. Several sub-units will develop

strategies toward one goal, hence the reason for multiple strategies within a goal. Action plans

are the most specific of all. For action plans to be successful, they must describe explicit

measures that will be taken to accomplish the strategy that supports a particular goal. They

generally apply to individuals or individual departments. Action plans are the pathways within

an institution for all to be able to contribute to the accomplishment of a goal (Bryson, 1995;

Cook, 1995; Thomas, 1996).

The intended use of technology can be expressed in a goal, a strategy, or an action plan.

For example, an institution may adopt a goal to infuse technology into the teaching and learning

process. Technology also may be named in a strategy as an approach to achieving a goal. If a

goal were to improve the teaching and learning process, one strategy for accomplishing that goal

might be to infuse the process with technology use.   Technology is most often mentioned,

however, by being included in an action plan as a method of achieving a specific strategy or goal. If a goal were to improve the teaching and learning process and a strategy for implementing the goal were that students would be presented with a more applied than theoretical experience, an action plan might state that students would spend a certain amount of time each week doing simulations on lab computers.   In these statements, the strategic planning document is serving as a vehicle for communication technology needs of the institution. According to Bryson (1995), it is one of the major benefits of strategy formulation. It can be used to identify an insufficiency of resources and thus avoid failure of the plan.

Strategy formulation can serve other means besides communicating resource needs. Bryson (1995) states that they are necessary "…in order to coordinate the activities of the numerous professionals, technicians, and frontline personnel likely to be involved in the process" (p. 166).

Planning Participants

Once administrators in an institution embark upon strategic planning, it is imperative to its success that they address three major aspects of planning: (a) the plan must have the support of higher administration, especially the president; (b) there must be an involvement of all key constituencies on campus; (c) the process and plan must consider the campus culture (Bryson, 1995; Cook, 1995; Korschgen, Fuller, & Lambert, 2000; Ringle & Updegrove, 1998; Ruben & Lehr, 1997; Ryan & Miller, 2000; Schmidtlein & Milton, 1990). Precisely who will participate is left for individual institutions to decide, but general guidelines are given in the literature.

The president is expected to set the general direction by establishing a vision for the institution. He may have help in developing its articulation. He must also explicitly support the resulting plan.   Higher administration, such as vice presidents and deans, and key respected faculty members generally join the president in the establishment of goals and strategies. Committees of general make-up, which are from administration, faculty, and staff, provide inputs to these steps, including the environmental assessments and descriptions of business processes. Departments and individuals determine actions needed to fulfill the goals through strategies and action plans. At any step in the process, others may join in strategic planning, depending upon the culture of the institution (Bryson, 1995; Cook, 1995).

Information Technology Planning

Information technology planning does not differ from institutional strategic planning with regard to process or general process outcomes such as vision, mission, and strategy formulation. Like the institutional strategic plan, vision and goals originate with senior management, in this case information technology senior managers who are often accompanied by trusted leaders of the institution. Strategies and action plans can be formulated further down in the organization. Information technology strategic planning is accomplished by committee. Needs assessments and descriptions of business processes are undertaken (Boar, 1993; Boar, 1994; Cassidy, 1998; Ringle & Updegrove, 1998).

The importance of strategic planning for technology cannot be overlooked. As Ringle and Updegrove (1998) effectively stated, "Without a strategic planning process for technology, it may be difficult to identify the connection between technology initiatives and the institutional goals they are designed to support" (p. 2). What differentiates information technology planning from institutional strategic planning are the reasons for which it undertaken, the outcomes that are expected, and the reasons for which it may fail.

It is common for literature to cite as the key reason for undertaking information technology planning is the need to establish a link between the goals of the institution and the goals of Information Technology (Boar, 1993; Bull, Dalliga-Hunter, Epelboin, Frachmann, & Jennings, 1994; Cassidy, 1998; Ringle & Updegrove, 1998). Boar (1994) stated that in technology planning, the "…overriding objective must be to achieve a state of strategic alignment between the business and the I/T organization" (p. 2). Ringle and Updegrove identified five other reasons that strategic planning for information technology had been undertaken: (a) to remain relevant by responding to change in technology, (b) to disseminate knowledge about technology needs and constraints, (c) to build alliances with key decision-makers, (d) to address existing technology needs, and (e) to aid in lobbying for another scarce resource, money. To these, Cassidy added that planning provided for the effective management of an expensive and critical asset of the institution, and that it was a means of allocating resources in an efficient and effective manner.

Because institutions today must be competitive in attracting students, a major hope of those who engage in information technology planning is to ensure that the institution has a competitive advantage (Cook, 1995; Boar, 1994; Ringle & Updegrove, 1998). It can ensure this

by enabling collaboration across departments, maximizing the re-use of resources, maximizing the speed of dispersal of information, minimizing process costs, enabling information sharing, collecting and analyzing data, enabling customization, and providing a bridge of communication to its partners that are also engaged in the educational endeavor (Boar, 1994). To this, Bull, Dalliga-Hunter, Epelboin, Frachmann, and Jennings (1994) added that effective information technology planning resulted in the changed qualification requirements of staff, meaning that not only could information technology be planned for, but so also could the training for its use.

Like institutional strategic planning, planning for information technology can fail, but not always for the same reasons. Boar (1994) identified four: (a) the strategic issues or gap-closing issues identified were, at their core, unsolvable; (b) information technology managers did as they wished without regard for alignment with institutional plans; (c) information technology management believed that success was defined as keeping the machines running; and (d) most interestingly, the field of information technology was really so new that its value-added ability could turn out to be nonexistent. In other words information technology just might turn out to be a passing fad.

<u>Alignment of Technology Planning with Institutional Plans</u>

Continuous change is assaulting institutions. Change is coming in two forms: socioeconomic and technical. Socioeconomic changes have altered the structure of society. Technological change continually ushers in newer and better tools, just as society is getting comfortable with the old. As rapidly as it may be changing, however, technical change has the ability to aid in socioeconomic change by helping institutions re-configure themselves as never before in order to meet new demands, but at a cost: institutions are having to deal with change and with a change in the tools that help to cope with change at the same time. It can be a very confusing arena in which to work (Ringle & Updegrove, 1998).

One way in which institutional leaders can attempt to channel these constant changes toward the good of the institution is by engaging in strategic planning and technology planning. It is imperative for the two to join in working together toward common goals, however, if technology is to be helpful to the institution at all as a change tool. This agreement is known as alignment (Boar, 1994; Cassidy, 1998; Cook, 1995; NIST, 2001).

Alignment occurs when all parts of the institution "…naturally and harmoniously work together to accomplish a common end" (Boar, 1994, p. 2). Alignment occurs when all share a sense of purpose and where processes, systems and structures are compatible in supporting a common vision and common goals (Boar, 1994; The University of Memphis Information Technology Strategic Plan, 2001). Boar (1994) stated that perfect alignment occurred between strategic planning and information technology planning when information technology was used in an institution to create and exploit business opportunities. He said that could only occur if information technology planning leaders were aware of, and synchronized with, institutional strategic planning where business opportunities were considered and developed.

Another argument for alignment centers on cost. Technology today is not inexpensive. Boar (1993) stated that management should never be confused concerning the purpose of such an expensive resource. It should be used to further a competitive advantage through the achievement of institutional goals. Again, information technology managers must know what those goals are if they are to contribute toward their realization.

Alignment of strategic planning and information technology planning has additional benefits for technology as well. Alignment gives technology a focus and a direction in which to head. The strategic plan provides information technology with directives that "…guide, prioritize, lead and shape the IT strategic planning effort" (Boar, 1993, p. 53).

It seems apparent that technology is destined to remain integral to institutions of higher education. As such, leaders of each institution should recognize its importance by ensuring that it gets adequate support as a mission-critical resource. This can be achieved when institutional strategic planning and planning for technology are aligned toward the common vision of the institution.

CHAPTER 3

RESEARCH METHODOLOGY

Introduction

This chapter describes the methodology used in the study of determining the extent to which institutional strategic planning in TBR institutions is used as a way of communicating the technology needs of the institution. Included are a description of the research design, an explanation of the population and sample, the design of the survey instrument including the variables and hypotheses of the instrument, and a description of data collection and analysis.

Research Design

According to Cook (1995) and Bryson (1995), successful strategic planning involved developing a strategic plan within the culture in which it was to function. In other words, for the planning to be successful, it needs to take into account the culture that exists within an institution and use it to craft a document that could be used for that particular institution alone. For this reason, the planning process exhibits the conventional traits of a qualitative study where the physical reality (the document) and the social reality (the process) are studied as one (Gall, Borg, & Gall, 1996; Merriam, 1998). Qualitative studies seek to explore, generate hypotheses, and in general assume that "…social reality is continuously constructed in local situations" (Merriam, p. 30) when studying a sample of the population. They are accomplished by surveying a very small sample of a population. By contrast, quantitative studies explain, test established hypotheses, and assume that "…social reality is relatively constant across time and settings" (p. 30). The sample sizes of quantitative studies are, by comparison with qualitative studies, much larger in numbers (Gall, Borg, & Gall).

Creswell (1998) stated that a particular study methodology should be chosen in keeping with the interests of the researcher. With that in mind, a quantitative approach to this research will be undertaken. Of particular interest to me is that a larger sample of the population can be surveyed, thus yielding a wider array of replies. This leads more easily toward generalizability, the aim of most quantitative studies. Instead of surveying two or three institutions of higher education, all 19 of the TBR institutions can be surveyed with a single quantitative survey instrument that will yield numerical data. Because the sample for this study will be larger than if

it were a qualitative study, it is important that the quantity of data be manageable. That is easily and reliably accomplished with numerical data resulting from a study such as this. The data can then be analyzed using a statistical package such as SPSS and Microsoft's Excel. The numerical data gleaned from the study are reported through descriptive and inferential statistics.

The objective of the study was to determine the degree to which institutions' strategic plans suggest in their narrative or in the supporting documentation the technology needed to successfully accomplish the goals of their respective strategic plans. In keeping with this objective and the quantitative methodology to be used, a survey instrument was formulated with the help of four dean-level administrators at East Tennessee State University. Seventeen research questions were formulated that were given to three groups of administrators on each TBR campus: chief academic officer, dean-level administrators, and chief information officer. Those 17 questions are as follows:

1. To what extent is the strategic planning document helpful in achieving the institutional vision?

2. How often is technology used as a strategy for achieving institutional goals?

3. How often is technology acknowledged in the strategic plan and/or its supporting documentation as supporting goals of the institution? Please choose only one.

4. How often is technology specifically cited as a strategy for implementing business processes identified in the strategic plan and/or its supporting documentation? (A business process describes how a procedure is carried out such as enrolling a student, checking out a library book, determining financial aid, awarding financial aid, developing curriculum, and the like.)

5. Does the strategic plan and/or its supporting documentation specify that a technology access fee be used as a strategy for acquiring technology toward the implementation of strategic goals?

6. What is the extent to which the information technology plan is aligned with the institutional strategic plan at your institution?

7. In the past year why was technology purchased?

8. At what point in the strategic planning process are technology needs generally considered?

9. During the strategic planning process what is the primary way of determining technology resources needed to accomplish the plan?

10. To what extent is the office of information technology relied upon for guidance in helping determine how technology could be used as a strategy to accomplish planning goals?

11. To what extent does the office of information technology provide input during the strategic planning process that will help determine the strategies used in accomplishing the goals stated in the institutional strategic plan?

12. Is the office of chief information officer represented on the strategic planning committee either as a voting or non-voting member?

13. How often is the strategic planning document and/or its supporting documentation used as a vehicle for communicating the technology needs of the institution?

14. At your institution, to what extent is the strategic plan and/or its supporting documentation helpful in aiding information technology to develop its goals?

15. How often is the institutional strategic plan and/or its supporting documentation used for guidance in determining what to include in the institutional technology plan?

16. To what extent is the office of information technology advised about the goals of the institution stated in the institutional strategic plan?

17. Is the office of chief academic officer represented on the information technology planning committee either as a voting or non-voting member?

<u>Population and Sample</u>

Strategic planning should be undertaken by an institution's highest levels of administrators in conjunction with key leaders at all levels – lower echelons of administrators, faculty and staff members (Bryson, 1995; Cook, 1995). With that in mind, it can be said that

high level administrators and key leaders on every campus comprise the population for this study, because it is from this body that strategic planners are chosen. Therefore, the people holding these offices comprise the population for this study. It is composed of the incumbents of those offices that the literature cites as typically being included in the strategic planning process. The population is composed of the administrators who serve in the capacities of chief academic officer, deans or directors, and chief information officers. Academic administrators were chosen because, in the main, strategic plans tend to focus on academic matters. Chief information officers were chosen because of their high level positions in administration (usually vice-presidents) and because of the insight they can provide toward this research regarding technology planning.

Nineteen chief information officers and 19 chief academic officers, a total of 38, or one from each institution, were asked to participate in the study. In addition, from five to seven academic deans or academic directors from each of the 19 institutions were asked to participate. There were 150 questionnaires sent out for the study.

<center>Variables</center>

The purpose of this study was to ascertain the degree to which the institutional strategic plans, with their supporting documentation of needs assessments and current business processes, were used collectively as vehicles for communicating technological needs in the 19 TBR institutions. The study sought responses to the 17 research questions by the use of the predictor variables of institutional classification, and of the professional title held by each respondent.

Responses to institutional classification resulted in one of two answers. Responses are either that of a two-year or a four-year institution. There are six four-year institutions and 13 two-year institutions in the TBR system.

Each respondent's professional title falls in one of three possible categories: (a) chief academic officer, (b) dean, director, or coordinator, or (c) chief information officer. As the chief academic officer manages the academic affairs, so the chief information officer manages technology on each campus.

The criterion variables in the study included the information gained from the 17 research questions posed in Chapters 1 and restated in Chapter 3. Each of the 17 questions included in

the survey instrument was accompanied by a question that asked for an open-ended response from each respondent to provide additional information regarding the question. Also, an open-ended question was added to the questionnaire as question 18, which asked for guided input regarding strategic planning for technology.

<u>Hypotheses</u>

Thirty-four summary hypotheses were formulated to test the 17 research questions. Each was stated in null form.

Hypotheses 1 and 2 addressed the research question: "To what extent is strategic planning instrumental in helping institutions achieve their visions and missions?" Hypothesis one: There are no differences among the respondents with different job titles with regard to the question. Hypothesis two: There are no differences between or among respondents in different classifications of institutions with regard to the question.

Hypotheses 3 and 4 were designed to test the research question: "How often is technology used as a strategy for achieving institutional goals?" Hypothesis three: There are no differences among the respondents with different job titles regarding their response to the question. Hypothesis four: There are no differences between or among respondents in different classifications of institutions regarding their response to the question.

Hypotheses 5 and 6 were designed to test the research question: "How often is technology acknowledged in the strategic plan and/or its supporting documentation as supporting goals of the institution?" Hypothesis five: There are no differences among the respondents with different job titles regarding their response to the question.   Hypothesis six: There are no differences between or among respondents in different classifications of institutions regarding their response to the question.

Hypotheses 7 and 8 were designed to test the research question: "How often is technology specifically cited as a strategy for implementing business processes identified in the strategic plan and.or its supporting documentation?" Hypothesis seven: There are no differences among the respondents of different job title regarding their response to the question. Hypothesis eight: There are no differences between or among respondents in different classifications of institutions regarding their response to the question.

Hypotheses 9 and 10 were designed to test the research question: "Does the strategic plan and/or its supporting documentation specify that a technology access fee be used as a strategy for acquiring technology toward the implementation of strategic goals?" Hypothesis nine: There are no differences among the respondents with different job titles regarding their response to the question regarding their response to the question. Hypothesis ten: There are no differences between or among respondents in different classifications of institutions regarding their response to the question .

Hypotheses 11 and 12 were designed to test the research question: "What is the extent to which the information technology plan is aligned with the institutional strategic plan at your institution?" Hypothesis 11: There are no differences among the respondents with different job titles regarding their response to the question. Hypothesis 12: There are no differences between or among respondents in different classifications of institutions regarding their response to the question.

Hypotheses 13 and 14 were designed to test the research question: "In the past year, why was technology purchased?" Hypothesis 13: There are no differences among the respondents with different job titles regarding their response to the question. Hypothesis 14: There are no differences between or among respondents in different classifications of institutions regarding their response to the question.

Hypotheses 15 and 16 were designed to test the research question: "At what point in the strategic planning process are technology needs generally considered?" Hypothesis 15: There are no differences among the respondents with different job titles regarding their response to the question. Hypothesis 16: There are no differences between or among respondents in different classifications of institutions regarding their response to the question.

Hypotheses 17 and 18 were designed to test the research question: "During the strategic planning process what is the primary way of determining technology resources needed to accomplish the plan?" Hypothesis 17: There are no differences among the respondents with different job titles regarding their response to the question. Hypothesis 18: There are no differences between or among respondents in different classifications of institutions regarding their response to the question.

Hypotheses 19 and 20 were designed to test the research question: "To what extent is the office of information technology relied upon for guidance in helping determine how technology

could be used as a strategy to accomplish planning goals?" Hypothesis 19: There are no differences among the respondents with different job titles regarding their response to the question. Hypothesis 20: There are no differences between or among respondents in different classifications of institutions regarding their response to the question.

Hypotheses 21 and 22 were designed to test the research question: "To what extent does the office of information technology provide input during the strategic planning process that will help determine the strategy used in accomplishing the goals stated in the institutional strategic plan?" Hypothesis 21: There are no differences among the respondents with different job titles regarding their response to the question. Hypothesis 22: There are no differences between or among respondents in different classifications of institutions regarding their response to the question.

Hypotheses 23 and 24 were designed to test the research question: "Is the office of chief information officer represented on the strategic planning committee either as a voting or non-voting member?" Hypothesis 23: There are no differences among the respondents with different job titles regarding their response to the question. Hypothesis 24: There are no differences between or among respondents in different classifications of institutions regarding their response to the question.

Hypotheses 25 and 26 were designed to test the research question: "How often is the strategic planning document and/or its supporting documentation used as a vehicle for communicating the technology needs of the institution?" Hypothesis 25: There are no differences among the respondents with different job titles regarding their response to the question. Hypothesis 26: There are no differences between or among respondents in different classifications of institutions regarding their response to the question.

Hypotheses 27 and 28 were designed to test the research question: "To what extent is the strategic plan and/or its supporting documentation helpful in aiding information technology to develop its goals??" Hypothesis 27: There are no differences among the respondents with different job titles regarding their response to the question. Hypothesis 28: There are no differences between or among respondents in different classifications of institutions regarding their response to the question.

Hypotheses 29 and 30 were designed to test the research question: "How often is the institutional strategic plan and/or its supporting documentation used for guidance in determining

what to include in the institutional technology plan?" Hypothesis 29: There are no differences among the respondents with different job titles regarding their response to the question. Hypothesis 30: There are no differences between or among respondents in different classifications of institutions regarding their response to the question.

Hypotheses 31 and 32 were designed to test the research question: "To what extent is the office of information technology advised about the goals of the institution stated in the institutional strategic plan?" Hypothesis 31: There are no differences among the respondents with different job titles regarding their response to the question. Hypothesis 32: There are no differences between or among respondents in different classifications of institutions regarding their response to the question.

Hypotheses 33 and 34 were designed to test the research question: "Is the office of chief academic officer represented on the information technology planning committee either as a voting or non-voting member?" Hypothesis 33: There are no differences among the respondents with different job titles regarding their response to the question. Hypothesis 34: There are no differences between or among respondents in different classifications of institutions regarding their response to the question.

<div align="center">Survey Instrument Design</div>

With personal knowledge gained as a technology administrator, a survey questionnaire was formulated that was critiqued by dean-level administrators. Each dean was interviewed personally and the questionnaire was revised according to his or her recommendations. The instrument was then given to members of a doctoral educational research class for their assessment. Their comments helped clarify phrasing, timing, and seeming appropriateness of each question and response. The instrument was revised and sent to deans for their final comments.

<div align="center">Data Collection</div>

An electronic survey was developed that provided each participant with an opportunity to provide a response to each of the 17 questions formulated to test the hypotheses. The survey was developed using HTML forms and was validated before submittal using JavaScript. No response

could be submitted for tally unless each of the first 17 questions had a response. No responses were required for any of the open-ended questions.

The form was put on line at http:///www.neowebdev.com/elfox/survey12, a web site that I maintain. Answers were validated and fed directly into a Microsoft Access database in a format that was readily converted to Microsoft's Excel, which was used to generate descriptive statistics. From Excel, a file was extracted that was used in SPSS to generate inferential statistics.

Notification of the survey was sent out by electronic mail to the respondents identified. Included in the electronic mail was an explanation of the purpose of the survey and a hot-link to the instrument one the neowebdev web site.

Data Analysis

Analysis of the data is presented using descriptive and inferential statistics. Frequency, counts and the mean for each of the questions are listed in table format.   Descriptive statistics included responses in the "unsure" category. Also presented are tables containing any comments supplied for all of the questions. At the end of the descriptive statistics is a table of comments made by respondents in response to question 18, which is an open-ended question asking participants to provide further illumination upon the linkage between strategic planning and technology planning at his or her institution. Inferential statistics are presented in table format following all reporting of descriptive statistics and comments. Tests employed include Pearson's Chi Square where variables had dichotomous values, one-way analysis of variance (ANOVA), and the t-test of independent means.

It is common practice to report any "unsure" response in descriptive statistics, but to regard the response choice of "unsure" as missing data when generating inferential statistical data. That practice was followed in this study.   For these reasons, and because responses were required for every question, the count of responses remains the same for all questions on the survey, which is evident in the reporting of descriptive statistics. However, count for the inferential statistics varies depending upon whether a respondent chose "unsure" as a response. The exact count used for generating inferences is reported with each table of inferential data presented in the following chapter.

Summary

Chapter 3 has described the methodology used to provide answers to the central question of whether institutions use the strategic plan as a communications tool for determining resource needs. It has posed and presented 12 hypotheses that will test each of six research questions posed in this study. Additionally, it has provided a description of the population and sample; the variables of the study; the design of the survey instrument; the data collection, and data analysis procedures.

CHAPTER 4

RESULTS OF THE STUDY

This chapter presents the analysis of data collected for the study and the research findings related to the 34 hypotheses associated with the 17 research questions raised by the study. To collect the data necessary, all 19 of the Tennessee Board of Regents (TBR) institutions were surveyed by use of an electronic survey. The population for the study consisted of 150 individuals serving as strategic planners in positions of chief academic officer, chief information officer or dean/director/coordinator from each of the nineteen institutions. It was assumed, for purposes of this study, that each institution has one chief academic officer and one chief information officer. Numbers of deans/directors/coordinators varied by institution. All names were obtained by conducting a web search for each institution involved. If an institution's web site named an individual as head of an academic unit, that person was invited to participate in the survey as a dean/director/coordinator. Chief academic officers and chief information officers were identified using the same method.

A variety of statistical methods was used to classify, explain, and analyze the data to produce the research results. Descriptive statistics were used to present a summary of the characteristics of the data. Response rates, represented in table format are given for each question by institution type and position. Tables for comments, by question, are also included.

Means and standard deviations were calculated for each question. They served as a basis for further data analysis. These analyses were performed using inferential statistical methods appropriate for the level of measurements of the data. Inferential tests included the t-test for independent means, one-way analysis of variance (ANOVA), and, where variables were dichotomous, Pearson's Chi-Square. Microsoft's Excel as well as the statistical package SPSS were used to conduct the analysis. Tables displaying the results of the descriptive and inferential statistics follow in succeeding sections of this chapter.

This section presents a) a demographic summary of count of invited participants by position within type of institution, b) a demographic summary of count of respondents by position and by type, c) a summary of rate of response to specific choices within each question described by position and by type of institution, and d) comments by question by position within institution. Comments are reproduced here exactly as they were reported on the survey instrument. Microsoft's Excel was used to produce Tables 1 through 39, which comprise this section of the chapter.

Table 1 shows the count and percent of those invited to participate by position within type of institution. Community colleges, numbering 19 in the TBR system, comprised the largest percentage of invited participants.

Table 1

Demographic Summary of Invited Participants

Type	Position	Count	Percent
four yr		62	41.3%
	chief academic officer	6	4.0%
	chief information officer	6	4.0%
	dean/director/coordinator	50	33.3%
two yr		88	58.7%
	chief academic officer	13	8.7%
	chief information officer	13	8.7%
	dean/director/coordinator	62	41.3%
Grand Total		150	100.0%

This study was undertaken to determine the extent to which TBR schools use the strategic plan as a method for developing the institutional technology plan. Two fundamental questions were posed: 1) Is there a difference between the type of institution regarding the extent to which each uses the strategic plan as a vehicle for communicating technology needs? and, 2) Is there a

difference among positions regarding the extent to which each uses the strategic plan as a vehicle for communicating technology needs? The first step in answering those two questions was to formulate a tables to showing the response rate by position and by type to be used as a reference for further analysis. Because the on-line questionnaire used in this survey enforced that an answer be supplied for every question for every respondent, n for each question that allowed only one response stayed at a constant 92.   For those questions that allowed multiple responses, questions 7 and 8, n will be stated with the corresponding tables. Tables 2 through 39 describe the resulting data.

Table 2

Demographic Summary of Respondents

PART I			
Type Position		Count	Percent (N=150)
four yr		36	58.1%
	chief academic officer	6	100.0%
	chief information officer	4	66.7%
	dean/director/coordinator	26	52.0%
two yr		56	63.6%
	chief academic officer	9	69.2%
	chief information officer	4	30.8%
	dean/director/coordinator	43	69.4%
Grand Total		92	61.3%

PART II		
Category	Count	Percent (n=92)
Position		
chief academic officer	15	16.3%
chief information officer	8	8.7%
dean/director/coordinator	69	75%
Position Total	92	100%
Type		
four yr	36	39%
two yr	56	61%
Type Total	92	100%

Table 3

Response by Position and Type of Institution for Question 1

Q1: At your institution, to what extent is the strategic planning document helpful in achieving the institutional vision? Please choose only one.

Category	Response Rate				
	not at all	moderately	unsure	considerably	extremely
Position					
chief academic officer	0.0%	33.3%	0.0%	33.3%	33.3%
chief information officer	0.0%	12.5%	0.0%	62.5%	25.0%
dean/director/coordinator	7.2%	30.4%	8.7%	43.5%	10.1%
Position Total	5.4%	29.3%	6.5%	43.5%	15.2%
Type					
four yr	8.3%	27.8%	5.6%	47.2%	11.1%
two yr	3.6%	30.4%	7.1%	41.1%	17.9%
Type Total	5.4%	29.3%	6.5%	43.5%	15.2%

Table 4

Comments From Question 1

Type	Position	Comments
four yr	chief academic officer	"We are in the process of revising our startegic plan because we have found that the plan needs updating."
	chief information officer	"IT budget for the institution is allocated according to the priorities set forth in the IT stategic plan."
	dean/director/coordinator	"I am dean at a law school, but we do IT planning."
		"The document itself is largely a waste of time."
		" lack of funds impedes implementation"
		"Gives vision and communicates the vision to all stakeholders"
two yr	chief academic officer	" Planning does not realistically consider actual budgeting."
	dean/director/coordinator	"Because of budget constraints across the state, the strategic planning document is only moderately achieving the institutional vision."
		"Our strategic planning document is indeed useful when evaluating performance as well as formulating budget requests."
		"The college-s strategic plan is updated and supplemented each year with a three-year technology plan"
		"The goals are too broad and do not give a sure sense of direction."
		"The strategic planning document has received greater attention this year. Prior to this it was merely paper to most folks. Up until last semester there was not even a representative from Computer Services on the committee, - We are improving. This SP is signficantly better (quality + communication) that previous ones."

Table 5

Response by Position and Type of Institution for Question 2

Q2: At your institution, how often is technology used as a strategy for achieving institutional goals? Please choose only one.					
Category	Response Rate				
	seldom	occasionally	unsure	often	usually
Position					
chief academic officer	0.0%	13.3%	0.0%	73.3%	13.3%
chief information officer	0.0%	12.5%	0.0%	75.0%	12.5%
dean/director/coordinator	4.3%	15.9%	8.7%	53.6%	17.4%
Position Total	3.3%	15.2%	6.5%	58.7%	16.3%
Type	3.3%	15.2%	6.5%	58.7%	16.3%
four yr	2.8%	5.6%	8.3%	63.9%	19.4%
two yr	3.6%	21.4%	5.4%	55.4%	14.3%
Type Total	3.3%	15.2%	6.5%	58.7%	16.3%

Table 6

Comments From Question 2

Type	Position	Comments
four yr	chief information officer	"There are 8 major institutional goals, one is devoted to IT & completion of the others depends to varying degrees upon IT."
	dean/director/coordinator	"I really do not know what you mean by your question."
two yr	dean/director/coordinator	"According to the area/strategic goal association"
		"Technology is given considerable weight in strategic planning. Unfortunately, the budget restraints often supersede technology goals."
		"One example is the purchase and implementation of an integrated library system to achieve access goals for our students"

Table 7

Response by Position and Type of institution for Question 3

Category	Response Rate				
	seldom	occasionally	unsure	often	usually
Position					
chief academic officer	6.7%	0.0%	0.0%	66.7%	26.7%
chief information officer	0.0%	25.0%	0.0%	50.0%	25.0%
dean/director/coordinator	4.3%	17. 4%	2.9%	55.1%	20.3%
Position Total	4.3%	15.2%	2.2%	56.5%	21.7%
Type					
four yr	0.0%	16.7%	2.8%	63.9%	16.7%
two yr	7.1%	14.3%	1.8%	51.8%	25.0%
Type Total	4.3%	15.2%	2.2%	56.5%	21.7%

Q3: At your institution, how often is technology acknowledged in the strategic plan and/or its supporting documentation as supporting goals of the institution? Please choose only one.

Table 8

Comments From Question 3

Type	Position	Comments
four yr	chief academic officer	"While the general strategic plan is fairly non-specific in its references to technology, the supporting documents are quite specific."
two yr	dean/director/coordinator	"Some goals directly related; others are tangentially, e.g. communication has a technological bent" "Unfortunately to often Technology means computers. Technology is a lot more than computers and some people do not get that."

Table 9

Response by Position and Type of Institution for Question 4

Question 4: At your institution, how often is technology specifically cited as a strategy for implementing business processes identified in the strategic plan and/or its supporting documentation? (A business process describes how a procedure is carried out such as enrolling a student, checking out a library book, determining financial aid, awarding financial aid, developing curriculum and the like.) Please choose only one.

Category	Response Rate				
	seldom	occasionally	unsure	Often	Usually
Position					
chief academic officer	6.7%	0.0%	0.0%	66.7%	26.7%
chief information officer	0.0%	25.0%	0.0%	62.5%	12.5%
dean/director/coordinator	8.7%	20.3%	10.1%	42.0%	18.8%
Position Total	7.6%	17.4%	7.6%	47.8%	19.6%
Type					
four yr	5.6%	19.4%	5.6%	55.6%	13.9%
two yr	8.9%	16.1%	8.9%	42.9%	23.2%
Type Total	7.6%	17.4%	7.6%	47.8%	19.6%

Table 10

Comments From Question 4

Type	Position	Comments
four yr	chief information officer	"Again, supporting documents from various unirts are quite specific."
	dean/director/coordinator	"We have assigned a staff member to develop a web based application process for application for internal scholarships. This is a definite step forward in our use of technology for the business of enrolling and serving students."
two yr	dean/director/coordinator	"We continually add technological elements to all facets of the campus as they become available." "Use of technology is routine in most business processes. Innovative strategies and/or goals rather than routine are in the strategic plan."

Table 11

Response by Position and Type of Institution for Question 5

Question 5: At your institution, does the strategic plan and/or its supporting documentation specify that a technology access fee be used as a strategy for acquiring technology toward the implementation of strategic goals? Please choose only one.			
Category	Responses		
	no	unsure	yes
Position			
chief academic officer	20.0%	13.3%	66.7%
chief information officer	12.5%	0.0%	87.5%
dean/director/coordinator	17.4%	21.7%	60.9%
Position Total	17.4%	18.5%	64.1%
Type			
four yr	8.3%	25.0%	66.7%
two yr	23.2%	14.3%	62.5%
Type Total	17.4%	18.5%	64.1%

Table 12

Comments From Question 5

Type	Position	Comments
four yr	chief academic officer	"TAF is viewed as a source of strategic resources in the plan"
	chief information officer	"The fee is used only to support technology used for insturction."
two yr	chief academic officer	"Technology access fee plans are based on technology access fees; they are instrumental in providing students the technology to achieve academic goals"
	dean/director/coordinator	"We do have a technology access fee but I am unsure as to whether or not it is mentioned in our strategic document." "In our divisional budgets, we have specified the source of funds, technology access fee or other, when submitting." "While the strategic plan per se does not specify TAF funds, the budget process that implements the strategic plan does address the use of TAF funds within TBR and college guidelines." "We use it for this purpose- not sure if it-s in strategic plan" "It is not in the strategic plan but a technology access fee is charged" "Although we do have such a fee and depend upon it." "This is known but I am not sure that itis explictly stated" "The technology fee was adopted by the board for all the state colleges and universities."

Table 13

Response by Position and Type of Institution for Question 6

Question 6: In your opinion, what is the extent to which the information technology plan is aligned with the institutional strategic plan at your institution? Please choose only one.

Category	Response Rate				
	not at all	moderately	unsure	considerably	extremely
Position					
chief academic officer	0.0%	20.0%	13.3%	46.7%	20.0%
chief information officer	0.0%	25.0%	0.0%	25.0%	50.0%
dean/director/coordinator	2.9%	23.2%	7.2%	46.4%	20.3%
Position Total	2.2%	22.8%	7.6%	44.6%	22.8%
Type					
four yr	2.8%	22.2%	11.1%	44.4%	19.4%
two yr	1.8%	23.2%	5.4%	44.6%	25.0%
Type Total	2.2%	22.8%	7.6%	44.6%	22.8%

Table 14

Comments From Question 6

Type	Position	Comments
four yr	chief information officer	"All IT goals & objectives must roll up into institutional goals."
two yr	dean/director/coordinator	"We have two, separately-functioning computer services units" "The IT plan is done with the goals of the institution in mind. Every effort has been made to put an infrastructure in place that will support the strategic plan."

Table 15

Response by Position and Type of Institution for Question 7

Question 7: At your institution, in the past year, why was technology purchased? Please check all that apply. (177 responses evaluated)					
Category		Response Rate			
	unsure	to implement the strategic plan	replace old equipment	monies became available	other
Position					
chief academic officer	0.0%	36.1%	36.1%	13.9%	13.9%
chief information officer	0.0%	38.9%	44.4%	16.7%	0.0%
dean/director/coordinator	0.8%	35.1%	49.6%	5.3%	9.2%
Position Total	0.5%	35.7%	46.5%	8.1%	9.2%
Type					
four yr	0.0%	40.0%	50.0%	5.7%	4.3%
two yr	0.9%	33.0%	44.3%	9.6%	12.2%
Type Total	0.5%	35.7%	46.5%	8.1%	9.2%

Table 16

Comments From Question 7

Type	Position	Comments
four yr	chief academic officer	"To meet new student needs"
		"Electronic periodicals in library"
		"Technology was also purchased to support initiatives not originally considered in the plan."
	dean/ director/ coordinator	"Technology also was purchased to support specific research projects."
		"To get need equipment we did not have before and to do a job supposedly at less cost or to deliver a program over greater distances to more students."
two yr	chief academic officer	"To provide student more access to instructional technology"
		"to provide greater access for faculty, staff and students"
		"to add new equipment needed in some disciplines"
	dean/ director/ coordinator	"To expand or create new programs"
		"to implement new initiatives not in strategic plan in specific"
		"teaching labs,computer labs"
		"To implement new or extended use of technology."
		"To fulfill our mission as a technologically-current institution"
		"To provide additional equipment to expand the technical offerings within the institution"
		"Main focus of academic vp and others in admin."
		"To keep up with what is need to function in those areas where technology play and important role"
		"To take advantage of useful emerging technology."
		"special initiatives"
		"To expand educational programs and services at off-campus and extended sites. To provide academic support services to faculty staff and students."
		"To expand ability to deliver courses in a variety of formats"

Table 17

Response by Position and Type of Institution for Question 8

Q8: At your institution, at what point in the strategic planning process are technology needs generally considered? Please check all that apply. (185 checks evaluated)						
Category	Response Rate					
	before planning	after planning	during resource needs-analysis phase	during strategy formulation	not considered at planning time	other
Position						
chief academic officer	25.7%	11.4%	31.4%	25.7%	0.0%	5.7%
chief information officer	22.7%	13.6%	31.8%	27.3%	4.5%	0.0%
dean/director/ coordinator	20.0%	9.2%	38.3%	25.8%	2.5%	4.2%
Total Position	21.5%	10.2%	36.2%	26.0%	2.3%	4.0%
Type						
four yr	18.5%	7.7%	38.5%	32.3%	0.0%	3.1%
two yr	23.2%	11.6%	34.8%	22.3%	3.6%	4.5%
Total Type	21.5%	10.2%	36.2%	26.0%	2.3%	4.0%

Table 18

Comments From Question 8

Type	Position	Comments
four yr	chief information officer	"Throughout the entire process; often we learn a great deal as we go. That is not to say that we do not do as much reaserch as possible up front."
	dean/director/ coordinator	"Little evident of a planning process exists. The budget and the priorities tend to be the same as last year-s."
		"not at all"
two yr	chief academic officer	"Implementaion phase"
		"during the development of the technology plan"
		"I was not employed when the last strategic plan was created so I do not know."
	dean/director/ coordinator	"Technology needs are considered during budget planning which is tied to the strategic plan."
		"During annual unit planning and budgeting for the following fiscal year"
		"At budget time."

Table 19

Response by Position and Type of Institution for Question 9

Q9: At your institution, during the strategic planning process what is the primary way of determining technology resources needed to accomplish the plan? Please choose only one.

Category	Response Rate			
	not at planning time	informally	formally	other
Position				
chief academic officer	6.7%	6.7%	80.0%	6.7%
chief information officer	0.0%	25.0%	75.0%	0.0%
dean/director/coordinator	7.2%	23.2%	65.2%	4.3%
Total Position	6.5%	20.7%	68.5%	4.3%
Type				
four yr	2.8%	22.2%	72.2%	2.8%
two yr	8.9%	19.6%	66.1%	5.4%
Total Type	6.5%	20.7%	68.5%	4.3%

Table 20

Comments From Question 9

Type	Position	Comments
four yr	chief academic officer	"We have a systematic annual needs assessment which ties into longer term planning" "General technology needs are addressed in planning, but specific resources are addressed at the time of implementation."
	chief information officer	"We submit both an operational & capital budget that is aligned with our IT plan.Where budget is not allocated, the IT plan is subsequently adjusted. All objectives in the final approved plan are funded."
	dean/director/coordinator	"there are no resources" "By discussions with staff, faculty and IT personnel"
two yr	chief academic officer	"Technology committee composed of multidisciples" "See comment for question 8"
	dean/director/coordinator	"don-t know" "Strategic planning establishes long-term goals, not technological specifications. The strategic plan identifies WHAT needs to be achieved. Annual unit plans and the annual version of the 3-year techology plan describe HOW technology-related goals will be achieved." "We are not good at strategic planning."

Table 21

Response Rate by Position and Type of Institution for Question 10

Q10: At your institution, to what extent is the office of information technology relied upon for guidance in helping determine how technology could be used as a strategy to accomplish planning goals? Please choose only one.

Category	Response Rate				
	not at all	moderately	unsure	considerably	extremely
Position					
chief academic officer	6.7%	26.7%	6.7%	40.0%	20.0%
chief information officer	0.0%	12.5%	0.0%	37.5%	50.0%
dean/director/coordinator	10.1%	24.6%	8.7%	43.5%	13.0%
Position Total	8.7%	23.9%	7.6%	42.4%	17.4%
Type					
four yr	8.3%	19.4%	2.8%	52.8%	16.7%
two yr	8.9%	26.8%	10.7%	35.7%	17.9%
Type Total	8.7%	23.9%	7.6%	42.4%	17.4%

Table 22

Comments From Question 10

Type	Position	Comments
four yr	chief information officer	"As VP/CIO I am one of the Executive Officers and am involved in almost all institutional decisions."
	dean/director/coordinator	"We are an engineering college and we do our own IT work."
		"We get considerable advice and support from the university-s IS staff"
two yr	chief academic officer	"We use the term *Computer Services*"
	dean/director/coordinator	"Extremely--at least in terms of computer-related technology. Don-t forget that other types of technologies are essential for college laboratories, classrooms, and administration."
		"Our computer services personnel advise and assist during the budget cycle."
		"varies due to two units. There is no *office* of "
		"These units are not cohesive"
		"We don-t have an office of info tech"
		"we have no office of information technology"

Table 23

Response by Position and Type of Institution for Question 11

Q11: At your institution, to what extent does the office of information technology provide input during the strategic planning process that will help determine the strategies used in accomplishing the goals stated in the institutional strategic plan? Please choose only one.

Category	Response Rate				
	not at all	moderately	unsure	considerably	extremely
Position					
chief academic officer	0.0%	26.7%	6.7%	46.7%	20.0%
chief information officer	0.0%	12.5%	0.0%	50.0%	37.5%
dean/director/coordinator	7.2%	27.5%	11.6%	44.9%	8.7%
Position Total	5.4%	26.1%	9.8%	45.7%	13.0%
Type					
four yr	5.6%	19.4%	8.3%	47.2%	19.4%
two yr	5.4%	30.4%	10.7%	44.6%	8.9%
Type Total	5.4%	26.1%	9.8%	45.7%	13.0%

Table 24

Comments From Question 11

Type	Position	Comments
four yr	chief information officer	"I am a member of the institutional strategic planning committee."
two yr	dean/director/coordinator	"Computer services assists campus units in planning, but they also initiate and plan for the services they provide." "they try to have input"

Table 25

Response by Position and Type of Institution for Question 12

Q12: At your institution, is the office of the chief information officer represented on the strategic planning committee either as a voting member and/or as ex-officio? Please choose only one.

Category	Responses		
	no	unsure	yes
Position			
chief academic officer	20.0%	13.3%	66.7%
chief information officer	0.0%	0.0%	100.0%
dean/director/coordinator	5.8%	24.6%	69.6%
Position Total	7.6%	20.7%	71.7%
Type			
four yr	13.9%	25.0%	61.1%
two yr	3.6%	17.9%	78.6%
Type Total	7.6%	20.7%	71.7%

Table 26

Comments From Question 12

Type	Position	Comments
four yr	dean/director/ coordinator	"He is not involved in the law school-s strategic planning but he is very involved in the university-s IT strategic planning"
		"not sure what is meant by chief information officer"
two yr	chief academic officer	"We have a *Vice President for Technology* who reports directly to the President"
	dean/director coordinator	"But he doesn-t attend regularly."
		"ex-offici as of last semester"
		"no information offices"
		"Yes-when we had a strategic planning committee"

Table 27

Response by Position and Type of Institution for Question 13

Q13: At your institution, how often is the strategic planning document and/or its supporting documentation used as a vehicle for communicating the technology needs of the institution? Please choose only one.

Category	Response Rate				
	seldom	occasionally	unsure	often	usually
Position					
chief academic officer	6.7%	13.3%	6.7%	60.0%	13.3%
chief information officer	0.0%	12.5%	0.0%	75.0%	12.5%
dean/director/coordinator	13.0%	20.3%	10.1%	39.1%	17.4%
Position Total	10.9%	18.5%	8.7%	45.7%	16.3%
Type					
four yr	11.1%	16.7%	8.3%	50.0%	13.9%
two yr	10.7%	19.6%	8.9%	42.9%	17.9%
Type Total	10.9%	18.5%	8.7%	45.7%	16.3%

Table 28

Comments From Question 13

Type	Position	Comments
four yr	chief academic officer	"The TBR has a strategic planning document which includes the technology plan. It is widely shared internally as well as sent to system on an annual basis."
two yr	chief academic officer	"The Strategic Planning Committee meets several times a semester."
	dean/director/coordinator	"Our technology needs are not tightly connected to our strategic plan." "Specifically during budget planning in February and again in budget revisions in June and July." "Technology needs are only a small part of the entire strategic plan" "The question for us is not how OFTEN (the strategic plan is typically developed only once every five years) but rather how EXTENSIVELY the strategic plan communicates technology needs. To answer the latter, the strategic plan outlines major technological needs, then the 3-year technology plan and the annual TAF plan describe computer technology needs in detail. Non-computer technology needs are defined annually in unit improvement goals."

Table 29

Response by Position and Type of Institution for Question 14

Q14: At your institution, to what extent is the strategic plan and/or its supporting documentation helpful in aiding information technology to develop its goal? Please choose only one

Category	Response Rate				
	not at all	moderately	unsure	considerably	extremely
Position					
chief academic officer	0.0%	20.0%	20.0%	40.0%	20.0%
chief information officer	0.0%	25.0%	0.0%	62.5%	12.5%
dean/director/coordinator	5.8%	23.2%	14.5%	47.8%	8.7%
Position Total	4.3%	22.8%	14.1%	47.8%	10.9%
Type					
four yr	5.6%	22.2%	8.3%	55.6%	8.3%
two yr	3.6%	23.2%	17.9%	42.9%	12.5%
Type Total	4.3%	22.8%	14.1%	47.8%	10.9%

Table 30

Comments From Question 14

Type	Position	Comments
two yr	dean/director/coordinator	"Establishes desired long-range outcomes"

Table 31

Response by Position and Type of Institution for Question 15

Q15: At your institution, how often is the institutional strategic plan and/or its supporting documentation used for guidance in determining what resources to plan for in the institutional technology plan? Please choose only one.

Category	Response Rate				
	seldom	occasionally	unsure	often	usually
Position					
chief academic officer	0.0%	6.7%	6.7%	66.7%	20.0%
chief information officer	0.0%	12.5%	0.0%	50.0%	37.5%
dean/director/coordinator	7.2%	14.5%	15.9%	49.3%	13.0%
Position Total	5.4%	13.0%	13.0%	52.2%	16.3%
Type					
four yr	5.6%	16.7%	8.3%	50.0%	19.4%
two yr	5.4%	10.7%	16.1%	53.6%	14.3%
Type Total	5.4%	13.0%	13.0%	52.2%	16.3%

Table 32

Comments From Question 15

Type	Position	Comments
two yr	dean/director/coordinator	"I am not at all involved in the technology plan." "The long-range or strategic plan focus on desired outcomes, not resource needs. The new unit planning process will allow for plans AND BUDGETS to be proposed for multi-year periods."

Table 33

Response Rate by Position and Type of Institution for Question 16

Q16: At your institution, to what extent is the office of information technology advised about the goals of the institution stated in the institutional strategic plan? Please choose only one.

Category	Response Rate				
	not at all	moderately	unsure	considerably	extremely
Position					
chief academic officer	0.0%	0.0%	6.7%	46.7%	46.7%
chief information officer	0.0%	0.0%	12.5%	37.5%	50.0%
dean/director/coordinator	20.3%	2.9%	5.8%	39.1%	31.9%
Position Total	15.2%	2.2%	6.5%	40.2%	35.9%
Type					
four yr	13.9%	0.0%	8.3%	41.7%	36.1%
two yr	16.1%	3.6%	5.4%	39.3%	35.7%
Type Total	15.2%	2.2%	6.5%	40.2%	35.9%

Table 34

Comments From Question 16

Type	Position	Comments
two yr	dean/director/coordinator	"The staff of the IT office, like every employee of the college, receives copies of the college-s strastegic goals. No employee is any more or less informed about strategic goals than another." "They are part of the strategic planning process" "total disconnect between these entities"

Table 35

Response by Position and Type of Institution for Question 17

Q17: At your institution, is the office of the chief academic officer represented on the information technology planning committee either as a voting member and/or as ex-officio? Please choose only one.

Category	Response Rate		
	no	unsure	yes
Position			
chief academic officer	33.3%	0.0%	66.7%
chief information officer	12.5%	0.0%	87.5%
dean/director/coordinator	10.1%	17.4%	72.5%
Position Total	14.1%	13.0%	72.8%
Type			
four yr	8.3%	5.6%	86.1%
two yr	17.9%	17.9%	64.3%
Type Total	14.1%	13.0%	72.8%

Table 36

Comments From Question 17

Type	Position	Comments
four yr	chief academic officer	"Those reporting to office are"
	chief information officer	"All Executive Officers and Deans participate in IT planning."
two yr	dean/director/ coordinator	"Deans and assistants to the chief academic officer are represented as voting members." "On one of the two units- committee- not the other" "Represented-Yes-by appointed staff." "The CAO is the driving force behind the technology plan." "The committee has representation from the academic area, usually faculty members" "Usually one or more of the academic deans, who report directly to the academic VP is on the committee."

Question 18 was an open-ended question: Please provide any information you feel would be helpful in explaining the technology planning process and/or the institutional strategic planning process and their correlation at your institution. Comments supplied by participants are presented in Tables 37 through 39. The comments are presented exactly as given on the questionnaire.

Table 37

General Comments of Respondents From Four-Year Institutions

Type	Position	Comments
four yr	chief information officer	"One phase of the IT planning process is to assure their alignment." "Institutional plan used as the basis for the IT plan. Each IT goal and strategy is aligned with an institutional goal."
	dean/director/ coordinator	"more emphsis needs to be placed on the linkages between the strategic plan of the University and the strategic plans of the various colleges and schools" "I have been at this university less than six months and therefore selected *unsure* in response to many of your questions. However, I have found considerable problems with technology access and support, and have been disappointed with the response from the information technology unit." "The person who heads up the IT office must be highly competent or thought of as so. Otherwise, his/her decisions are not considered." "The [name of institution] does not use its strategic plan. In fact, being listed as a *destination area* is detrimental to one-s budget. The strategic plan was totally constructed by people who are no longer here." "The university does both strategic planning and IT planning. The law school has a strategic plan and does IT planning for law school instruction and research activities. " "The VP for information systems participates in the planning process as does any other major division." "We have a formal process that is evaluated and updated annually." "As an technological University we have refocused our technological goals to include information technology as well as engineering."

Table 38

General Comments of Chief Academic Officers and Chief Information Officers From Two-Year Institutions

Type	Position	Comments
two yr	chief academic officer	"The technology planning process is completely integrated with the institution-s strategic plan."
		"The college engages in annual strategic planning process. As part of this process the college develops an information technology plan that is intergrated into the stratgic plan. The college uses this document to guide the development of its administrative and academic programming throughout the year. This document is also linked to the budget."
	chief information officer	"The Chief Technology Officer is on the Strategic Planning Committee for the institution. The IT Plan is formulated after the Strategic Plan is completed and is used to develop the IT Plan."
		"There are strong linkages between both the technology planning process and the institutional strategic planning process. The Technology Plan is developed annually in conjunction with the strategic planning and budgeting processes. Progress towards the Technology Plan and the Strategic Plan is used for benchmarking and institutional effectiveness purposes."

Table 39

General Comments of Deans/Directors/Coordinators From Two-Year Institutions

Type	Position	Comments
two yr	dean/ director/ coordinator	"The strategic planning process-goals objectives and accomplishments are tied to the institutional budget planning process. The institution has a standing committee-Technology Planning Committee and a Technology Access Fee Committee. Each of these committees are tied to the institutional planning process and the budget process. The Institutional Five Year Strategic Plan; the Three Year Technology Plan and the Institutional Budgets(by division) are all interdependent and work as *one* working plan."

"We have a technology strategic plan which complements our institutional strategic plan. The two work hand in hand."

"Our process begins at the level of the individual instructor/office/program and requests/needs are input for the process and consideration. TAF funds are vital for the technology access for all student-related matters"

"Academic computing and administrative computing are separate and report to two different vice presidents, Academic Affairs and Business and Finance. There is often a need to coordinate their work between the tow offices."

"The technology program coordinators and department head meet monthly with the v.p. of Information Services to discuss hardware/software, etc. needs and priorities."

"Some of my answers are only guesses; I am not, strictly speaking, in any of the categories listed in Demographics #3; I am a dept head"

"These questions were hard to answer. At our college, strategic planning permeates all activities. It is a cycle. It is never finished and put on a shelf to be dusted off at intervals. Technology planning is just a part of the overall process. The questionaire treats technology planning as something separate from strategic planning."

"This college follows all TBR requirements for strategic planning, TAF planning, and 3-year technology plans. Each is separate, distinct, and has its own timeframe--yet all are related over time. As you noticed in earlier comments, the strategic plan which is developed every five years was not adequate to guide the issues raised in your questions. Other plans addressed those needs. "

"What did you really mean by *technology*? Often *technology* and *computer-related technology* are taken as the same. On our campus, the most dollars are spent on computer-related needs. However, non-computer technologies are essential for the delivery of quality instruction and the provision of quality operational service. Floor wax strippers or microscopes may not be as exotic as Pentium IVs but are just as essential in their own context."

"Our technology *set-up* (ie, two technology units) makes it difficult to accurately respond to the questions you have asked."

"Chief technology officer is an Associate Vice President reporting to the Vice President of Academic Affairs. As this office is newly created and the current VPAA is also new (interim), some of the processes about which you asked are in either transitional or formative stages."

"Technology planning and institutional strategic planning are inextricably joined together."

"Members of the IT Committee are leaders at the college and are leaders in the planning process. They seem to tie technology in with the goals that we formulate. Also, departments are required to list technology needs with their goals and objectives."

"There has not been a tremendous amount of correlation up until about a year ago. The two processes happened independently, At budget time a computer resource committe with representatives from vital areas would meet to consider technology spending requests and their importance to the mission. Currently more attention has been paid to the entire strategic planning process and we are all hopeful it will prove to be a benefit to the entire campus and improve the service and planning of computer services."

"A strategic planning team that consists of representatives from all major areas of the college is assembled to develop the strategic plan. Technology is integrated into the planning process by this team. Technology plans are not developed seperately from the institutional strategic plan."

"I am not sure of the technology planning process. It is handled by two units on our campus and they function within themselves. Minutes are shared with the rest of the campus."

"As I said earlier, they are not tightly connected. The SP does mention technology, mostly in terms of distance ed and deliver of student support services. Also, some goals (improve internal communication) include but are not specific to technology. In general, I don-t see how our technology plan is derived from or supported by our Strategic Plan, BUT I am not that familiar with the technology plan." |

<u>Analysis Of Data</u>

Thirty-four hypotheses were generated for this study. Each was stated in null format. Every set of two was associated with one unique research question corresponding to one unique survey question. The first of the set sought to hypothesize regarding differences among positions held by respondents of the survey. The second of the set sought to hypothesize regarding differences among respondents from different types of institutions.   For purposes of analysis, responses of unsure were considered missing from the data and were eliminated from evaluation. For those research questions whose values were not dichotomous (questions 1 through 4, 6, 9 through 11, and 13 through 16) the one-way analysis of variance (ANOVA) was used to test the hypotheses relating to position while the t-test for independent samples was used to test the hypotheses relating to type of institution. For research questions whose values were dichotomous (questions 5, 7, 8, 12, and 17) Pearson's Chi-Square was used to test hypotheses relating to both position and to type of institution. Responses to questions 1 through 4, 6, 10 through 11, and 13 through 16 were assigned numeric values, which were used in calculations of the inferential tests. A value of 4 was assigned to responses of extremely or usually; 3 to responses of considerably or often; 2 to responses of occasionally or moderately and 1 to responses of seldom or not at all.   A mean of 2.50 for one of these questions would indicate that half of the respondents chose extremely or usually while the remaining half chose either seldom or not at all. Questions 5, 12 and 17 required responses of no or yes. Yes was assigned a value of 2; a value of 1 was assigned to no. A mean of 1.5 for these questions would indicate that half of the respondents chose no and half chose yes. Question 9 was assigned values to responses as follows: 4 for other, 3 for by formal procedure/documentation, 2 for intuitively, and 1 for resources not determined at the time of planning. A mean of 2.5 for this question would indicate that half the respondents chose other or resources were determined by formal procedure/documentation while the other half chose either intuitively or resources are not determined at the time of planning. Questions 7 and 8 allowed for multiple answers. Each choice for both of these questions was treated as an independent variable with dichotomous

values of either present or not present. A mean of 1.5 for any one of the responses in these questions would mean that half chose the option while half did not.

For every test, a preset value of alpha 0.5 was used to determine whether the hypothesis would be rejected or would fail to be rejected. Each question offered the choice of "unsure." For purposes of statistical analysis, the unsure categories were regarded as missing and were not included in the testing.

Results of the tests are presented in Tables 40 through 73. Research questions and related hypotheses are interspersed to help understand the results. For each hypothesis, it is noted whether test results indicated that the hypothesis was rejected or whether test results indicate a failure to reject the hypothesis.

Hypothesis 1, tested by survey question 1 was as follows: There are no differences among the respondents with different job titles in their perceptions of the strategic plan as an aid in helping an institution achieve its vision and mission. Results of this test yielded $p > .05$ so that the null hypothesis was retained. Table 40 shows the supporting data.

Table 40

Analysis by Position for Question 1 of Hypothesis 1

Q1: At your institution, to what extent is the strategic planning document helpful in achieving the institutional vision? Please choose only one.			
Position	Responses evaluated	Mean	SD
chief academic officer	15	3.00	0.85
chief information officer	8	3.13	0.64
dean/director/coordinator	63	2.62	0.79

$F(2, 83) = 2.50$

Hypothesis 2, tested by survey question 1, was as follows: There are no differences between or among respondents in different classifications of institutions regarding their perceptions of the strategic plan as an aid in helping an institution achieve its vision and mission. Results of this test yielded $p > .05$ so that the null hypothesis was retained. Table 41 shows the supporting data.

Table 41

Analysis by Type of Institution for Question 1 of Hypothesis 2

Q1: At your institution, to what extent is the strategic planning document helpful in achieving the institutional vision? Please choose only one.

Type	Responses evaluated	Mean	SD
four yr	34	2.65	0.85
two yr	52	2.79	0.64

$t(84) = -.796$

Hypothesis 3, tested by survey question 2, was as follows: There are no differences among the respondents with different job titles in their perceptions of how often technology is used as a strategy for achieving institutional goals. Results of this test yielded $p > .05$ so that the null hypothesis was retained. Table 42 shows the supporting data.

Table 42

Analysis by Position for Question 2 of Hypothesis 3

Q2: At your institution, how often is technology used as a strategy for achieving institutional goals? Please choose only one.

Position	Responses evaluated	Mean	SD
chief academic officer	15	3.00	.53
chief information officer	8	3.00	.53
dean/director/coordinator	63	2.92	.75

$F(2, 83) = .108$

Hypothesis 4, tested by survey question 2, was as follows: There are no differences between or among respondents in different classifications of institutions regarding their perceptions of how often technology is used as a strategy for achieving institutional goals. Results of this test yielded $p > .05$ so that the null hypothesis was retained. Table 43 shows the supporting data.

Table 43

Analysis by Type of Institution for Question 2 of Hypothesis 4

Q2: At your institution, how often is technology used as a strategy for achieving institutional goals? Please choose only one.

Type	Responses evaluated	Mean	SD
four yr	33	3.09	0.63
two yr	53	2.84	0.72

$\underline{t}(84) = 1.590$

Hypothesis 5, tested by survey question 3, was as follows: There are no differences among the respondents with different job titles in their perceptions of how often technology is acknowledged in the strategic plan and/or its supporting documentation as supporting goals of the institution.. Results of this test yielded $\underline{p} > .05$ so that the null hypothesis was retained. Table 44 shows the supporting data.

Table 44

Analysis by Position for Question 3 of Hypothesis 5

Q3: At your institution, how often is technology acknowledged in the strategic plan and/or its supporting documentation as supporting goals of the institution? Please choose only one.

Position	Responses evaluated	Mean	SD
chief academic officer	15	3.13	.74
chief information officer	8	3.00	.76
dean/director/coordinator	67	2.94	.76

$\underline{F}(2, 87) = .405$

Hypothesis 6, tested by survey question 3, was as follows: There are no differences between or among respondents in different classifications of institutions regarding their perceptions of how often technology is acknowledged in the strategic plan and/or its supporting documentation as supporting goals of the institution. Results of this test yielded $\underline{p} > .05$ so that the null hypothesis was retained. Table 45 shows the supporting data.

Table 45

Analysis by Type of Institution for Question 3 of Hypothesis 6

Q3: At your institution, how often is technology acknowledged in the strategic plan and/or its supporting documentation as supporting goals of the institution? Please choose only one.

Type	Responses evaluated	Mean	SD
four yr	35	3.00	0.59
two yr	55	2.96	0.84

$t(88) = .223$

Hypothesis 7, tested by survey question 4, was as follows: There are no differences among the respondents with different job titles in their perceptions of how often technology is specifically cited as a strategy for implementing business processes identified in the strategic plan and/or its supporting documentation. Results of this test yielded $p > .05$ so that the null hypothesis was retained. Table 46 shows the supporting data.

Table 46

Analysis by Position for Question 4 of Hypothesis 7

Q4: At your institution, how often is technology specifically cited as a strategy for implementing business processes identified in the strategic plan and/or its supporting documentation? (A business process describes how a procedure is carried out such as enrolling a student, checking out a library book, determining financial aid, awarding financial aid, developing curriculum and the like.) Please choose only one.

Position	Responses evaluated	Mean	SD
chief academic officer	15	3.13	.74
chief information officer	8	2.88	.64
dean/director/coordinator	62	2.79	.89

$F(2, 82) = .991$

Hypothesis 8, tested by survey question 4, was as follows: There are no differences between or among respondents in different classifications of institutions regarding their perceptions of how often technology is specifically cited as a strategy for implementing business processes identified in the strategic plan and/or its supporting documentation. Results of this test yielded $p > .05$ so that the null hypothesis was retained. Table 47 shows the supporting data.

Table 47

Analysis by Type of Institution for Question 4 of Hypothesis 8

Q4: At your institution, how often is technology specifically cited as a strategy for implementing business processes identified in the strategic plan and/or its supporting documentation? (A business process describes how a procedure is carried out such as enrolling a student, checking out a library book, determining financial aid, awarding financial aid, developing curriculum and the like.) Please choose only one.

Type	Responses evaluated	Mean	SD
four yr	34	2.82	.76
two yr	51	2.88	.91

$\underline{t}$(83) = .-312

Hypothesis 9, tested by question 5, was as follows: There are no differences among the respondents with different job titles in their perceptions of whether the strategic plan and/or its supporting documentation specifies that a technology access fee is used as a strategy for acquiring technology toward the implementation of strategic goals. The question was tested using Pearson's Chi-Square because the values for variables in the question were dichotomous. However, the results indicated that there was a violation in the assumptions made by the test because there were at least two instances where the expected count of results fell below five indicating that there was not enough variation among the results to make an assumption of the probability of the test. It is important to note, however, that each position responding for question 5 indicated with a greater than 75.0% rate that the technology access fee was used as a strategy for acquiring technology toward the implementation of the strategic goals. Table 48 presents the results.

Table 48

Analysis by Position for Question 5 of Hypothesis 9

Question 5: At your institution, does the strategic plan and/or its supporting documentation specify that a technology access fee be used as a strategy for acquiring technology toward the implementation of strategic goals? Please choose only one.

Position	Response Count	No	Yes
chief academic officer	13	23.1%	76.9%
chief information officer	8	12.5%	87.5%
dean/director/coordinator	56	22.2%	77.8%

Hypothesis 10, tested by survey question 5, was as follows: There are no differences between or among respondents in different classifications of institutions regarding their perceptions of whether the strategic plan and/or its supporting documentation specify that a technology access fee be used as a strategy for acquiring technology toward the implementation of strategic goals.   Results of this test yielded $p > .05$ so that the null hypothesis was retained. Table 49 shows the supporting data.

Table 49

Analysis by Type of Institution for Question 5 of Hypothesis 10

Q5: At your institution, does the strategic plan and/or its supporting documentation specify that a technology access fee be used as a strategy for acquiring technology toward the implementation of strategic goals? Please choose only one.

Type	Response Count	No	Yes
four year	27	11.1%	88.9%
two year	48	27.1%	72.9%

X^2 (1, N=75) = 2.627

Hypothesis 11, tested by survey question 6, was as follows: There are no differences among the respondents with different job titles in their perceptions of the extent to which the information technology plan is aligned with the institutional strategic plan.   Results of this test yielded $p > .05$ so that the null hypothesis was retained. Table 50 shows the supporting data

Table 50

Analysis by Position for Question 6 of Hypothesis 11

Q6: In your opinion, what is the extent to which the information technology plan is aligned with the institutional strategic plan at your institution? Please choose only one.

Position	Responses evaluated	Mean	SD
chief academic officer	13	3.00	.71
chief information officer	8	3.25	.89
dean/director/coordinator	64	2.91	.77

$F(2, 82) = .732$

Hypothesis 12, tested by survey question 6, was as follows: There are no differences between or among respondents in different classifications of institutions regarding their perceptions of the extent to which the information technology plan is aligned with the institutional strategic plan. Results of this test yielded $p > .05$ so that the null hypothesis was retained. Table 51 shows the supporting data

Table 51

Analysis by Type of Institution for Question 6 of Hypothesis 12

Q6: In your opinion, what is the extent to which the information technology plan is aligned with the institutional strategic plan at your institution? Please choose only one.

Type	Responses evaluated	Mean	SD
four yr	32	2.91	0.78
two yr	53	2.98	0.77

$t(83) = -.432$

Hypothesis 13, tested by question 7, was as follows: There are no differences among the respondents with different job titles in their perceptions of why technology was purchased within the last year. The hypothesis was tested using Pearson's Chi-Square since the values for variables in the question were dichotomous. However, the results indicated that there was a violation in the assumptions made by the test for the questions because there were at least two instances where the expected count of results fell below five indicating that there was not enough variation among the results to make an assumption of the probability of the test. It should be noted that the response rate for

the possible response of "other" was less than 35% for each position, indicating that, for

the greatest majority, technology was purchased for one of the reasons indicated on the

survey instrument. Table 52 presents the results.

Table 52

Analysis by Position for Question 7 of Hypothesis 13

Q7: At your institution, in the past year, why was technology purchased? Please check all that apply. (177 answers evaluated)

Position

	unsure		implement the strategic plan		to replace old equipment		to spend monies available		other	
	Count	%	Count	%	Count	%	Count	%	Count	%
chief academic officer	0	0.0%	13	86.7%	13	86.7%	5	33.3%	5	33.3%
chief information officer	0	0.0%	7	87.5%	8	100%	3	37.5%	0	0.0%
dean/ director/ coordinator	1	1.4%	46	66.7%	65	94.2%	7	10.1%	12	17.4%

Hypothesis 13, tested by question 7, was as follows: There are no differences between or

among respondents in different classifications of institutions regarding their perceptions of why,

in the last year, technology was purchased. Question 7 allowed for multiple responses. Because

of this, each response was treated as a separate variable so that each resulted in the dichotomous

values of present or not present. Pearson's Chi-Square was then used to evaluate the variables.

For the responses of "unsure" and "to replace old equipment" there was not enough variation

among responses for the test to yield a value for the probability. As a result the assumptions of

the test were violated and no clarification could be made with regard to rejection or retention of

the null hypothesis. Note, however, that for variable 1, that of "unsure", there was only one

respondent that answered in the affirmative. For variable 3, "to replace old equipment" over

90% of the respondents checked that this is so. For the second ("to implement the strategic

plan") and fourth values ("to spend monies available") the results of the test indicated $p > .05$, so

that the null hypothesis was retained. For variable 5 ("other") the test indicated $p < .05$ so that

the null hypothesis was rejected. In other words, there was a difference between respondents from different types institutions in responding to this question. Respondents from two-year schools judged that there were reasons for purchasing technology other than those listed on the survey instrument while those in the four-year schools did not. Results are presented in Table 53.

Table 53

Analysis by Type of Institution for Question 7 of Hypothesis 14

Question 7: At your institution, in the past year, why was technology purchased? Please check all that apply. (177 responses evaluated)

Type	unsure		to implement the strategic plan		to replace old equipment		to spend monies available		other	
	Count	%	Count	%	Count	%	Count	%	Count	%
four yr	0	0.0%	28	77.8%	35	97.2%	4	11.1%	3	8.3%
two yr	1	1.8%	38	67.9%	51	91.1%	11	19.6%	14	25.0%
			$X^2(1, N = 92) = 1.064$				$X^2(1, N = 92) = 1.169$		$X^2(1, N = 92) = 4.041; \underline{p} < .05$	

Hypothesis 15, tested by research question 8, was as follows: There are no differences between or among the respondents with different job titles in their perceptions of when, in planning, technology needs are considered. Pearson's Chi-Square was used to test this hypothesis for each of the dichotomous variables. In each case, there was a violation of the assumptions of the test because there were at least two cells for each variable with fewer than a count of five. In cases such as this, the data were not varied enough to produce a probability value. Percentages indicated that technology needs were considered before planning begins, during the resource needs analysis phase, during strategy formulation, and at other times not considered by the survey instrument. Results are shown in Table 54.

Table 54

Analysis by Position for Question 8 of Hypothesis 15

Q8: At your institution, at what point in the strategic planning process are technology needs generally considered? Please check all that apply (185 responses evaluated)

Position	before planning begins		after planning is completed		during resource needs analysis		during strategy formulation		not considered at planning time		other	
	Count	%	Count	%	Count	%	Count	%	Count	%	Count	%
chief academic officer	9	60.0%	4	26.7%	11	73.3%	9	60.0%	2	13.3%	10	66.7%
chief information officer	5	62.5%	3	37.5%	7	87.5%	6	75.0%	0	0.0%	7	87.5%
dean/ director/ coordinator	24	34.8%	11	15.9%	46	66.7%	31	44.9%	5	7.2%	50	87.7%

Hypothesis 16, tested by research question 8, was as follows: There are no differences between or among respondents in different classifications of institutions regarding their perceptions of when, in planning, technology needs are considered. Pearson's Chi-Square was used to test this hypothesis for each of the dichotomous variables. The first four variables resulted in a failure to reject the null hypothesis ($p > .05$). For the final 2 variables ("not considered at planning time" and "other") there was a violation of the assumptions of the test because there were at least two cells for each variable with fewer than a count of five. The data were not varied enough to produce a probability value. Percentages pointed out that respondents, when categorized by type of institution. indicated that technology needs were considered at planning time and that the survey instrument captured over 90.0% of instances in which technology needs were considered. Results are shown in Table 55.

Table 55

Analysis by Type of Institution for Question 8 of Hypothesis 16

Q8: At your institution, at what point in the strategic planning process are technology needs generally considered? Please check all that apply.

Type	before planning begins		after planning is completed		during resource needs analysis		during strategy formulation		not considered at planning time		other	
	Count	%	Count	%	Count	%	Count	%	Count	%	Count	%
four yr	12	33.3%	5	13.9%	25	69.4%	21	58.3%	0	0.0%	2	5.6%
two yr	26	46.4%	13	23.2%	39	69.6%	25	44.6%	4	7.1%	5	8.9%
	$X^2 (1, N) = 92 =$ 1.550		$X^2 (1, N) = 92 =$ 1.211		$X^2 (1, N) = 92 =$ 0.000		$X^2 (1, N) = 92 =$ 1.643					

Hypothesis 17, answered by question 9, was as follows: There are no differences between or among the respondents of different job title in their perceptions of the extent to which technology resource needs are determined by formal or by informal approach. There was a failure to reject the null hypothesis as a result of the test ($p > .05$). Results are shown in Table 56.

Table 56

Analysis by Position for Question 9 of Hypothesis 17

Q9: At your institution, during the strategic planning process what is the primary way of determining technology resources needed to accomplish the plan? Please choose only one.

Position	Responses evaluated	Mean	SD
chief academic officer	15	2.87	.64
chief information officer	8	2.75	.46
dean/director/coordinator	69	2.67	.68
Grand Total	92	2.71	.66

$F(2, 89) = .588$

Hypothesis 18, answered by question 9, was as follows: There are no differences between or among respondents in different classifications of institutions regarding their perceptions of the degree to which technology resource needs are determined by formal or by informal approach. Results indicate da failure to reject the null hypothesis ($p > .05$).   Results are shown in Table 57.

Table 57

Analysis by Type of Institution for Question 9 of Hypothesis 18

Q9: At your institution, during the strategic planning process what is the primary way of determining technology resources needed to accomplish the plan? Please choose only one.

Type	Responses evaluated	Mean	SD
four yr	36	2.75	.55
two yr	56	2.68	.72

$t(90) = .508$

Hypothesis 19, tested by research questions 10, is as follows: There are no differences among the respondents with different job titles in their perceptions of the extent to which the office of information technology is relied upon for guidance in helping determine how technology could be used as a strategy to accomplish planning goals. Results of testing showed a failure to reject the null hypothesis ($p > .05$). Results are presented in Table 58.

Table 58

Analysis by Position for Question 10 of Hypothesis 19

Q10: At your institution, to what extent is the office of information technology relied upon for guidance in helping determine how technology could be used as a strategy to accomplish planning goals? Please choose only one.

Position	Responses evaluated	Mean	SD
chief academic officer	14	2.79	.89
chief information officer	8	3.38	.74
dean/director/coordinator	63	2.65	.86

$F(2,82) = 2.543$

Hypothesis 20, tested by question 10, was as follows: There are no differences between or among respondents in different classifications of institutions regarding their perceptions of the extent to which the office of information technology is relied upon for guidance in helping determine how technology could be used as a strategy to accomplish planning goals. Results indicated a failure to reject the null hypothesis ($p > .05$).   Results are shown in Table 59.

Table 59

Analysis by Type of Institution for Question 10 of Hypothesis 20

Q10: At your institution, to what extent is the office of information technology relied upon for guidance in helping determine how technology could be used as a strategy to accomplish planning goals? Please choose only one.

Type	Responses evaluated	Mean	SD
four yr	35	2.80	0.83
two yr	50	2.70	0.91

$t(83) = .516$

Hypothesis 21, tested by research question 11, was as follows: There are no differences among the respondents with different job titles in their perceptions of the extent to which the office of information technology provides input during the strategic planning process that will help determine the strategies used in accomplishing the goals stated in the institutional strategic plan. Results of testing showed a failure to reject the null hypothesis ($p > .05$). Results are presented in Table 60.

Table 60

Analysis by Position for Question 11 of Hypothesis 21

Q11: At your institution, to what extent does the office of information technology provide input during the strategic planning process that will help determine the strategies used in accomplishing the goals stated in the institutional strategic plan? Please choose only one.

Position	Responses evaluated	Mean	SD
chief academic officer	14	2.93	.73
chief information officer	8	3.25	.71
dean/director/coordinator	61	3.62	.78

$F(2, 80) = 2.919$

Hypothesis 22, tested by question 11, was as follows: There are no differences between or among respondents in different classifications of institutions regarding their perceptions of the extent to which the office of information technology provides input during the strategic planning process that will help determine the strategies used in accomplishing the goals stated in the institutional strategic plan. Results indicated a failure to reject the null hypothesis ($p > .05$). Results are shown in Table 61.

Table 61

Analysis by Type of Institution for Question 11 of Hypothesis 22

Q11: At your institution, to what extent does the office of information technology provide input during the strategic planning process that will help determine the strategies used in accomplishing the goals stated in the institutional strategic plan? Please choose only one.

Type	Responses evaluated	Mean	SD
four yr	33	2.88	.82
two yr	50	2.64	.75

$\underline{t}(81) = 1.368$

Hypothesis 23, tested by research question 12, was as follows: There are no differences among the respondents with different job titles in their perceptions of whether the chief information officer is represented on the strategic planning committee either as a voting or non-voting member. Pearson's Chi-Square was used to test the dichotomous variables for question 12. Because at least two cells resulted in values less than five, the test failed to determine either the rejection or retention of the null hypothesis associated with this question. Over 75.0% of respondents indicated, however, that the chief information officer was represented on the strategic planning committee either as a voting or non-voting member. Results are presented in Table 62.

Table 62

Analysis by Position for Question 12 of Hypothesis 23

Q12: At your institution, is the office of chief information officer represented on the strategic planning committee either as a voting or non-voting member? Please choose only one.

Position	Response Count	No	Yes
chief academic officer	13	23.1%	76.9%
chief information officer	8	0.0%	100%
dean/director/coordinator	56	7.7%	92.3%

Hypothesis 24, tested by research question 12, was as follows: There are no differences among the respondents from different types of institutions in their perceptions of whether the chief information officer is represented on the strategic planning committee either as a voting or non-voting member. Pearson's Chi-Square was used to test the dichotomous variables for question 12. Because at least two cells resulted in values less than five, the test failed to determine either the rejection or retention of the null hypothesis associated with this question. Over 80.0% of respondents, regardless of type of institution in which they were employed, indicated that the chief information officer was represented on the strategic planning committee either as a voting or non-voting member. Results are presented in Table 63.

Table 63

Analysis by Type of Institution for Question 12 of Hypothesis 24

Q12: At your institution, is the office of chief information officer represented on the strategic planning committee either as a voting or non-voting member? Please choose only one.			
Type	Response Count	No	Yes
four year	27	18.5%	81.5%
two year	46	4.3%	95.7%

Hypothesis 25, tested by research question 13, was as follows: There are no differences between or among the respondents with different job titles in their perceptions of how often the strategic planning document and/or its supporting documentation is used as a vehicle for communicating the technology needs of the institution. Results of the test showed a failure to reject the null hypothesis ($p > .05$). Results are presented in Table 64.

Table 64

Analysis by Position for Question 13 of Hypothesis 25

Q13: At your institution, how often is the strategic planning document and/or its supporting documentation used as a vehicle for communicating the technology needs of the institution? Please choose only one.

Position	Responses evaluated	Mean	SD
chief academic officer	14	2.86	.77
chief information officer	8	3.00	.53
dean/director/coordinator	62	2.68	.95

$F(2, 81) = .605*$

Hypothesis 26, tested by research question 13, was as follows: There are no differences between or among the respondents from different types of institutions in their perceptions of how often the strategic planning document and/or its supporting documentation is used as a vehicle for communicating the technology needs of the institution. Results of the test showed a failure to reject the null hypothesis ($p > .05$). Results are presented in Table 65.

Table 65

Analysis by Type of Institution for Question 13 of Hypothesis 26

Q13: At your institution, how often is the strategic planning document and/or its supporting documentation used as a vehicle for communicating the technology needs of the institution? Please choose only one.

Type	Responses evaluated	Mean	SD
four yr	33	2.73	.88
two yr	51	2.75	.91

$t(82) = -.089$

Hypothesis 27, tested by research question 14, was as follows: There are no differences between or among the respondents with different job titles in their perceptions of the extent to which the strategic plan and/or its supporting documentation is helpful in aiding information technology develop its goals. Results of the test showed a failure to reject the null hypothesis ($p > .05$). Results are presented in Table 66.

Table 66

Analysis by Position for Question 14 of Hypothesis 27

Q14: At your institution, to what extent is the strategic plan and/or its supporting documentation helpful in aiding information technology to develop its goals? Please choose only one.

Position	Responses evaluated	Mean	SD
chief academic officer	12	3.00	.74
chief information officer	8	2.88	.64
dean/director/coordinator	59	2.69	.75

$\underline{F}(2, 76) = .961$

Hypothesis 28, tested by research question 14, was as follows: There are no differences between or among the respondents from different types of institutions in their perceptions of the extent to which the strategic plan and/or its supporting documentation is helpful in aiding information technology develop its goals. Results of the test showed a failure to reject the null hypothesis ($\underline{p} > .05$). Results are presented in Table 67.

Table 67

Analysis by Type of Institution for Question 14 of Hypothesis 28

Q14: At your institution, to what extent is the strategic plan and/or its supporting documentation helpful in aiding information technology to develop its goals? Please choose only one.

Type	Responses evaluated	Mean	SD
four yr	33	2.73	.72
two yr	46	2.78	.76

$\underline{t}(82) = -0.327$

Hypothesis 29, tested by research question 15, was as follows: There are no differences between or among the respondents with different job titles in their perceptions of how often the institutional strategic plan and/or its supporting documentation is used for guidance in determining what to include in the institutional technology plan. Results of the test showed a failure to reject the null hypothesis ($p > .05$). Results are presented in Table 68.

Table 68

Analysis by Position for Question 15 of Hypothesis 29

Q15: At your institution, how often is the institutional strategic plan and/or its supporting documentation used for guidance in determining what to include in the institutional technology plan? Please choose only one.

Position	Responses evaluated	Mean	SD
chief academic officer	14	3.14	.53
chief information officer	8	3.25	.71
dean/director/coordinator	58	2.81	.80

$F(2, 77) = 1.971$

Hypothesis 30, tested by research question 30, was as follows: There are no differences between or among the respondents from different types of institutions in their perceptions of how often the institutional strategic plan and/or its supporting documentation is used for guidance in determining what to include in the institutional technology plan. Results of the test showed a failure to reject the null hypothesis ($p > .05$). Results are presented in Table 69.

Table 69

Analysis by Type of Institution for Question 15 of Hypothesis 30

Q15: At your institution, how often is the institutional strategic plan and/or its supporting documentation used for guidance in determining what to include in the institutional technology plan? Please choose only one.

Type	Responses evaluated	Mean	SD
four yr	33	2.91	.80
two yr	47	2.91	.75

$t(78) = -0.033$

Hypothesis 31, tested by research question 16, was as follows: There are no differences between or among the respondents with different job titles in their perceptions of the extent to which the office of information technology is advised about the goals of the institution stated in the institutional strategic plan.   Results of the test showed a failure to reject the null hypothesis ($p > .05$). Results are presented in Table 70.

Table 70

Analysis by Position for Question 16 of Hypothesis 31

Q16: At your institution, to what extent is the office of information technology advised about the goals of the institution stated in the institutional strategic plan? Please choose only one.

Position	Responses evaluated	Mean	SD
chief academic officer	15	3.40	.63
chief information officer	8	3.38	.74
dean/director/coordinator	55	3.25	.75

$F(2, 75) = .288$

Hypothesis 32, tested by research question 16, was as follows: There are no differences between or among the respondents from different types of institutions in their perceptions of the extent to which the office of information technology is advised about the goals of the institution stated in the institutional strategic plan.   Results of the test showed a failure to reject the null hypothesis ($p > .05$). Results are presented in Table 71.

Table 71

Analysis by Type of Institution for Question 16 of Hypothesis 32

Q16: At your institution, to what extent is the office of information technology advised about the goals of the institution stated in the institutional strategic plan? Please choose only one.

Type	Responses evaluated	Mean	SD
four yr	31	3.32	.65
two yr	47	3.28	.77

$t(76) = 0.273$

Hypothesis 33 tested by question 17, was as follows: There are no differences between

or among the respondents with different job titles in their perceptions of whether the office of the chief academic officer is represented on the technology planning committee either as a voting or non-voting member. Results were inconclusive using Pearson's Chi-Square to test the hypothesis. Assumptions of the test were violated by the small count in at least two of the cells; therefore, the hypothesis could neither be rejected nor retained. However, over 65%, regardless of position of respondent, replied that the office of the chief academic officer was represented on the technology planning committee as either a voting or non-voting member. Results are presented in Table 72.

Table 72

Analysis by Position for Question 17 of Hypothesis 33

Q17: At your institution, is the office of the chief academic officer represented on the information technology planning committee either as a voting or non-voting member? Please choose only one.

Position	Response Count	No	Yes
chief academic officer	15	33.3%	66.7%
chief information officer	8	12.5%	87.5%
dean/director/coordinator	57	12.3%	87.7%

Hypothesis 34, tested by question 17, was as follows: There are no differences between or among the respondents from different types of institutions in their perceptions of whether the office of the chief academic officer is represented on the technology planning committee either as a voting or non-voting member. Results using Pearson's Chi-Square to test the hypothesis indicated a failure to reject the hypothesis ($p > .05$). Results are presented in Table 73.

Table 73

Analysis by Type of Institution for Question 17 of Hypothesis 34

Q17: At your institution, is the office of the chief academic officer represented on the information technology planning committee either as a voting or non-voting member? Please choose only one.

Type	Response Count	No	Yes
four year	33	8.8%	91.2%
two year	46	21.7%	78.3%

$X^2(1, N=80)=2.396$

CHAPTER 5

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

This chapter offers a summary of the research described in Chapters 1 through 3, the results of which are presented in Chapter 4. It offers conclusions based upon the survey results from Chapter 4 organized by the research questions posed in Chapters 1 and 3. It also presents conclusions drawn from the study and makes recommendations for possible areas for further research.

The purpose of the study was to determine the extent to which staffs from TBR institutions perceive that the technology planning document is linked to the institutional strategic planning document. It posed 17 research questions designed to gain that information. Two fundamental perceptions were sought: 1) was there a difference between or among respondents with regard to position held for each of these questions? and 2) was there a difference between respondents from different types of institutions for each of these questions? From these two perceptions for each of the 17 research questions 34 hypotheses were developed.

An online survey was developed that was designed to gather the information necessary to make conclusions regarding the study questions. The survey was coded so that participants were required to answer each question before their responses could be submitted for evaluation. An email message was sent to a possible 150 participants asking them to contribute to the study. Two follow-up emails were sent as reminders. Ninety-two surveys were returned yielding a 61.0% response rate. Demographic data asking for the type of institution and the position of the respondent were also collected.

The following section presents a summary of the findings. Succeeding sections will include conclusions and recommendations drawn from the study.

Seventeen research questions were stated in Chapter 1 and restated in Chapter 3 to meet the objective of the study. The following are the findings for these research questions. Each research question related to a unique survey question.

Findings Related to Research Question 1

Research Question 1, corresponding to survey question 1, asked: To what extent is strategic planning instrumental in helping institutions achieve their vision and mission? Two hypotheses were developed regarding this question. The first of these hypothesized that there would be no differences between or among respondents with different job titles with regard to the research question. The second hypothesized that there would be no differences between respondents from different types of institutions with regard to the research question.

Results of statistical tests conducted for these hypotheses indicated a failure to reject the null hypotheses related to this question ($p > .05$). There were no differences between or among respondents holding different positions or between respondents from either four-year or two-year institutions with regard to the question posed.

Response rates for question 1 indicated that 53.6% of deans/directors/coordinators rated the strategic planning document as considerably or extremely helpful in achieving institutional vision, while the figure for chief academic officers was 66.6% and that of chief information officers was 87.0%. Response rates also indicated that 58.3% of respondents from four-year institutions rated the strategic planning document as considerably or extremely helpful in achieving the institutional vision while the figure for respondents from two-year institutions was 59.0%.

Comments for question 1 centered around two general themes: the strategic plan and budgeting. For all respondents from all positions and for respondents from both types of institutions, the strategic plan was either ineffective because it was a "waste of time", was "too broad to give a sense of direction" or was in the process of being revised. While one chief information officer commented that the information technology budget was "allocated according

to the priorities set forth in the IT strategic plan", others commented that the budget constrained the purchase of technology considerably.

<u>Findings Related to Research Question 2</u>

Research Question 2, corresponding to survey question 2, asked: How often is technology used as a strategy for achieving institutional goals? Two hypotheses were developed regarding this question. The first of these hypothesized that there would be no differences between or among respondents with different job titles with regard to the research question. The second hypothesized that there would be no differences between respondents from different types of institutions with regard to the research question.

Results of statistical tests conducted for these hypotheses indicated a failure to reject the null hypotheses ($p > .05$). There were no differences between or among respondents with different job titles or between respondents from either four-year or two-year institutions with regard to the question.

Response rates for the question indicated that a great majority of chief academic officers (86.6%) and chief information officers (87.5%) said that technology was often or usually used as a strategy for achieving institutional goals. For deans/directors/coordinators, the figure was 71.0%. At four-year schools respondents stated that technology was often to usually used as a strategy for achieving institutional goals in 83.3% of the cases reporting while the figure for respondents from two-year schools was 69.7%

There were 5 open-ended comments associated with this question. No major theme emerged. One stated that a major goal was "devoted to IT." Another noted that technology was "given considerable weight in planning" only to be cut during budgets.

<u>Findings Related to Research Question 3</u>

Research Question 3, corresponding to survey question 3, asked: How often is technology acknowledged in the strategic plan and/or its supporting documentation as supporting goals of the institution? Two hypotheses were developed regarding this question. The first of these hypothesized that there would be no differences between or among respondents with

different job titles with regard to the research question. The second hypothesized that there would be no differences between types of institutions with regard to the research question.

Results of statistical tests conducted for these hypotheses indicated a failure to reject the null hypotheses (p > .05). There were no differences between or among respondents with different job titles or between respondents from either four-year or two-year institutions with regard to the question.

Response rates for the question indicated that 75.0% or more of the respondents regardless of position held or from different types of institution stated that technology was often or usually acknowledged as supporting goals of the institution. At four-year schools, respondents stated that technology was often or usually acknowledged in the strategic plan for 81.6% of cases reporting while respondents from two-year schools the figure was 76.8%.

There were 3 open-ended comments associated with this question. They indicated that the acknowledgement of technology was often implied rather than actually stated.

Findings Related to Research Question 4

Research Question 4, corresponding to survey question 4, asked: At your institution, how often is technology specifically cited as a strategy for implementing business processes identified in the strategic plan and/or its supporting documentation? Two hypotheses were developed regarding this question. The first of these hypothesized that there would be no differences between or among respondents with different job titles with regard to the research question. The second hypothesized that there would be no differences between respondents from different types of institutions with regard to the research question.

Results of statistical tests conducted for these hypotheses indicated a failure to reject the null hypotheses (p > .05). There were no differences between or among respondents with different job titles or between respondents from either four-year or two-year institutions with regard to the question.

Response rates for the question indicated that for 93.4% of chief information officers and 85.0% of chief information officers, technology was often or usually cited as a strategy for

implementing business processes. The figure for deans/directors/coordinators was 60.8%. Respondents from four-year schools reported that technology was often or usually cited in 69.5% of the cases reporting while respondents from two-year schools reported that this was true in 66.1% of the cases.

There were 4 open-ended comments associated with this question. They indicated that the use of technology was "routine" or that "we continually add technological elements" and that "supporting documents are quite specific" about the use of technology.

Findings Related to Research Question 5

Research Question 5, corresponding to survey question 5, asked: At your institution, does the strategic plan and/or its supporting documentation specify that a technology access fee be used as a strategy for acquiring technology toward the implementation of strategic goals? Two hypotheses were developed regarding this question. The first of these hypothesized that there would be no differences between or among respondents with different job titles with regard to the research question. The second hypothesized that there would be no differences between respondents from different types of institutions with regard to the research question.

Results of statistical tests conducted for the first of these hypotheses failed to calculate a probability because all respondents tended to produce the same answer. Tests conducted for the second hypothesis indicated a failure to reject the null hypotheses ($p > .05$). In other words, there was no difference between respondents from different types of institutions with regard to the question.

Response rates of 66.7% for chief academic officers, 87.5% for chief information officers, and 60.9% for deans/directors/coordinators indicated that a technology access fee was named in strategic planning documentation as a means of acquiring technology. Rates also indicated that 13.3% of chief academic officers, 0.0% of chief information officers, and 21.7% of deans/directors/coordinators were unsure as to whether a technology access fee was addressed in the strategic plan. At four-year institutions 66.7% indicated that a technology access fee was named as a means of acquiring technology. Two-year schools stated that they believed that to be

the case 62.5% of the time. Four-year schools reported that 25.0% were unsure while at two-year institutions 14.3% were unsure.

There were 11 open-ended comments associated with this question. They indicated a technology fee was definitely relied upon but was not always mentioned in the strategic plan.

<u>Findings Related to Research Question 6</u>

Research Question 6, corresponding to survey question 6, asked: In your opinion, what is the extent to which the information technology plan is aligned with the institutional strategic plan? Two hypotheses were developed regarding this question. The first of these hypothesized that there would be no differences between or among respondents with different job titles with regard to the research question. The second hypothesized that there would be no differences between respondents from different types of institutions with regard to the research question.

Results of statistical tests conducted for these hypotheses indicated a failure to reject the null hypotheses ($p > .05$). There were no differences between or among respondents with different job titles or between respondents from either four-year or two-year institutions with regard to the question.

Response rates for the question pointed out that 75.0% of chief information officers said that the information technology plan was considerably or extremely aligned with the institutional strategic plan, while the figure for chief academic officers and deans/directors/coordinators was 66.1%. Respondents from four-year schools reported alignment in 63.8% of respondents reporting while responses from two-year schools stated that such was the case in 69.6% of respondents reporting.

There were 3 open-ended comments associated with this question. They indicated that at one institution, there were "two, separately-functioning computer services units" or that IT planning was done with institutional goals in mind.

<u>Findings Related to Research Question 7</u>

Research Question 7, corresponding to survey question 7, asked: In the past year why was technology purchased? Two hypotheses were developed regarding this question. The first of these hypothesized that there would be no differences between or among respondents with different job titles with regard to the research question. The second hypothesized that there would be no differences between respondents from different types of institutions with regard to the research question.

Results of statistical tests conducted for these hypotheses were either inclusive or indicated a failure to reject the null hypotheses related to this question ($\underline{p} > .05$). No conclusions could be drawn with regard to position of respondents because the great majority provided the same answer. Percentages indicate that greater than 85.0% of them purchased new equipment as a replacement for old. Over 85.0% of chief academic officers, 87.5% of chief information officers, and 66.7% of deans/directors/coordinators stated that technology was purchased to implement the strategic plan. Tests conducted by responses from different types of institution were mixed. When technology was purchased to implement the strategic plan or to spend monies available the null hypothesis was retained ($\underline{p} > .05$). With regard to replacing old equipment, for other reasons, or if a respondent was unsure, a violation of the test resulted because too few responded in those categories so that no probability could be derived.

Response rates for this question indicated that technology was purchased either to implement the strategic plan or to replace old equipment for 72.2% of chief academic officers, 83.3% of chief information officers, and 84.7% of deans/directors/coordinators. Four-year schools indicated that in 90.0% of cases reporting, technology was purchased to implement the strategic plan or to replace old equipment, while for two-year schools the figure was 77.3%. Respondents from two year- schools were much more likely to indicate that technology was purchased because monies became available (9.6%) than were respondents from four-year schools (5.7%).

The 20 comments for this question were related to applications for why technology was purchased. Several spoke to the purchase of technology for implementing new initiatives not mentioned in the strategic plan.

Findings Related to Research Question 8

Research Question 8, corresponding to survey question 8, asked: At what point in the strategic planning process are technology needs generally considered? Two hypotheses were developed regarding this question. The first of these hypothesized that there would be no differences between or among respondents with different job titles with regard to the research question. The second hypothesized that there would be no differences between respondents from different types of institutions with regard to the research question.

Results of statistical tests conducted for these hypotheses were mixed. No probability could be calculated with regard to position because there were several variables where the response rate fell below the required five. Percentages for this question indicated that for 73.3% of chief academic officers, 87.5% of chief information officers, and 66.7% of deans/directors/coordinators, technology needs were considered during resource needs analysis phase. Before planning begins or during strategy formulation accounted for the times when technology needs were considered for over 60.0% of chief academic officers and chief information officers. For 87.5% of chief information officers and 87.7% of deans/directors/coordinators, technology needs were considered at times other than those mentioned on the survey.

For the second hypothesis, the testing of variables "before planning begins," after planning is completed," "during resource needs analysis," and "during strategy formulation," produced a probability rate of $p > .05$ so that the null hypothesis was retained. Too few respondents answered "not considered at planning time" or "other" for a probability to be calculated by the tests. Percentages indicated that for over 65.0% of both four-year and two-year institutions, technology needs were considered during the resource needs analysis phase of

planning. For 58.3% of four-year respondents and 44.6% of two-year respondents, technology needs were considered during strategy formulation.

Response rates indicated support of percentages from inferential testing. A majority of participants, whether analyzed by job title or by different type of position, indicated that technology was purchased to implement the strategic plan or to replace old equipment.

The 9 comments relating to this question varied from technology needs are considered "throughout the entire process" to technology needs are considered "not at all."

Findings Related to Research Question 9

Research Question 9, corresponding to survey question 9, asked: During the strategic planning process what is the primary way of determining technology resources needed to accomplish the plan? Two hypotheses were developed regarding this question. The first of these hypothesized that there would be no differences between or among respondents with different job titles with regard to the research question. The second hypothesized that there would be no differences between respondents from different types of institutions with regard to the research question.

Results of statistical tests conducted to test these hypotheses indicated a failure to reject the null hypotheses ($p > .05$). There were no differences between or among respondents with different job titles or between respondents from either four-year or two-year institutions with regard to the question.

 Response rates indicated that 80.0% of chief academic officers and 75.0% of chief information officers had a formal procedure for determining technology resources needed to accomplish the strategic plan. The figure for deans/directors/coordinators was 65.2%. Respondents from four-year schools stated that technology needs were considered formally 72.2% of the time. Respondents from two-year schools stated this was true in 66.1% of cases reporting.

Of the 10 comments related to this question, several indicated that technology needs were considered in formal needs assessments done by groups across campus. Three indicated a lack

of knowledge or lack of resources.   One was resolute in saying that the strategic plan discusses the "what" not the "how" of technology, using capital letters to make clear the emphasis.

Findings Related to Research Question 10

Research Question 10, corresponding to survey question 10, asked: To what extent is the office of information technology relied upon for guidance in helping determine how technology could be used as a strategy to accomplish planning goals? Two hypotheses were developed regarding this question. The first of these hypothesized that there would be no differences between or among respondents with different job titles with regard to the research question. The second hypothesized that there would be no differences between respondents from different types of institutions with regard to the research question.

Results of inferential testing, with a probability of $p > .05$, indicated that the null hypotheses should be retained. There were no differences between or among respondents with different job titles or between respondents from either four-year or two-year institutions with regard to the question.

Response rates indicated that in 87.5% of responses, the office of information technology was considerably or extremely relied upon for guidance in helping determine how technology could be used as a strategy to accomplish planning goals. The figure for chief academic officers was 60.0%; for deans/directors/coordinators the figure was 56.5%. Respondents from four-year schools relied considerably or extremely upon the office of information technology in 69.5% of cases reporting. Respondents from two-year schools reported reliance upon the office of information technology in 53.6% of cases reporting.

Comments for this question generally indicated that IT personnel were involved in providing input to help determine how technology could be used in the planning process. Two indicated that there was no office of information technology.

Findings Related to Research Question 11

Research Question 11, corresponding to survey question 11, asked: To what extent does the office of information technology provide input during the strategic planning

process that will help determine the strategies used in accomplishing the goals stated in the institutional strategic plan? Two hypotheses were developed regarding this question. The first of these hypothesized that there would be no differences between or among respondents with different job titles with regard to the research question. The second hypothesized that there would be no differences between respondents from different types of institutions with regard to the research question.

Results of inferential testing, with a resulting probability of $p > .05$, indicated that the null hypotheses should be retained. There were no differences between or among respondents with different job titles or between respondents from either four-year or two-year institutions with regard to the question.

Response rates indicated that 87.5% of the office of information technology was considerably or extremely relied upon to provide input during the strategic planning process that helped determine the strategies used in accomplishing the goals stated in the institutional strategic plan. Chief academic officers reported a rate of 66.7% ,while deans/directors/coordinators reported a rate of 53.6%. Respondents from four-year institutions considerably or extremely relied upon the office of information technology for input in 66.6% of the cases. Respondents from two-year institutions reported a rate of 53.5%, or just over half.

Comments for this question generally indicated that IT personnel were involved in providing input to help determine how technology could be used in the planning process. One indicated that not only does IT provide support, but they also "initiate and plan for the services they provide."

Findings Related to Research Question 12

Research Question 12, corresponding to survey question 12, asked: Is the office of chief information officer represented on the strategic planning committee either as a voting or non-voting member? Two hypotheses were developed regarding this question. The first of these hypothesized that there would be no differences between or among respondents with different job titles with regard to the research question. The second hypothesized that there would be no

differences between respondents from different types of institutions with regard to the research question.

Results of inferential testing with Pearson's Chi Square were unable to calculate a probability because the greatest majority of respondents answered "yes." There were too few responses of either "no" or "unsure" to make inferences.

Percentages indicated that for 76.9% of chief academic officers, 100% of chief information officers, and 92.3% of deans/directors/coordinators, the office of the chief information officer was represented on the strategic planning committee. Results from respondents from four-year and two-year institutions indicated the same general answer. At four-year schools 81.5% of respondents indicated that the chief information officer was represented on the strategic planning committee, while the figure from two-year schools was at 95.7%.

Response rates indicated that 13.3% of chief information officers, 0.0% of chief academic officers, and 24.6% of deans/directors/coordinators were unsure about whether the chief information officer was represented on the strategic planning committee. Over 60% (61.1%) of four-year responders were unsure, while 78.6% of respondents from two-year schools were unsure.

Comments from the question indicated "he [the chief information officer] didn't attend regularly," "yes, when we had a planning committee," or there is "no information officer." One indicated that the chief information officer was not engaged in their school's planning, but generally helped out on the rest of the campus.

Findings Related to Research Question 13

Research Question 13, corresponding to survey question 13, asked: How often is the strategic planning document and/or its supporting documentation used as a vehicle for communicating the technology needs of the institution? Two hypotheses were developed regarding this question. The first of these hypothesized that there would be no differences between or among respondents with different job titles with regard to the research question. The

second hypothesized that there would be no differences between respondents from different types of institutions with regard to the research question.

Results of inferential testing, with a probability of $p > .05$, indicated that the null hypotheses should be retained. There were no differences between or among respondents with different job titles or between respondents from either four-year or two-year institutions with regard to the question.

Response rates indicated that 87.5% of chief information officers said that the strategic planning document and/or its supporting documentation was often or usually used as a vehicle for communicating the technology needs of the institution. For chief academic officers the figure was 73.3%. For deans/directors/coordinators the figure was 56.5%. Respondents from four-year schools often or usually relied upon the strategic planning document and/or its supporting documentation as a vehicle for communicating technology needs of the institution in 63.9% of cases reporting. For respondents from two-year institutions, the figure was 60.8%.

Comments for this question generally indicated that the strategic planning document was the basis for all planning. Two indicated that technology was only a part of the plan.   One pointed out that the question should have read how "*extensively* [not how often] the strategic plan communicates technology needs."

Findings Related to Research Question 14

Research Question 14, corresponding to survey question 14, asked: To what extent is the strategic plan and/or its supporting documentation helpful in aiding information technology to develop its goals? Two hypotheses were developed regarding this question. The first of these hypothesized that there would be no differences between or among respondents with different job titles with regard to the research question. The second hypothesized that there would be no differences between respondents from different types of institutions with regard to the research question.

Results of inferential testing yielded a probability of $p > .05$, indicating that the null hypotheses should be retained. There were no differences between or among respondents with

different job titles or between respondents from either four-year or two-year institutions with regard to the question.

Response rates of 75.0% for chief information officers indicated that the strategic plan and/or its supporting documentation was considerably or extremely helpful in aiding information technology develop its goals. The figure for chief academic officers was 60.0%; for deans/directors/coordinators, 56.5%. Of note in this question was the response rate for "unsure." Twenty percent of chief academic officers, 0.0% of chief information officers, and 14.5% of deans/directors/coordinators were unsure regarding the helpfulness of the strategic plan in aiding information technology develop its goals. Respondents from four-year schools stated that in 63.9% of cases reporting the strategic plan is helpful; respondents from two-year schools reported a rate of 55.4%. Over 8.0% of respondents from four year schools were unsure of the strategic plan's helpfulness. Respondents from two-year schools reported that 17.9% of them were unsure.

There was one comment for this question. It indicated that the strategic plan "establishes desired long-range outcomes."

Findings Related to Research Question 15

Research Question 15, corresponding to survey question 15, asked: How often is the institutional strategic plan and/or its supporting documentation used for guidance in determining what to include in the institutional technology plan? Two hypotheses were developed regarding this question. The first of these hypothesized that there would be no differences between or among respondents with different job titles with regard to the research question. The second hypothesized that there would be no differences between respondents from different types of institutions with regard to the research question.

Results of inferential testing, with a probability of $p > .05$, indicated that the null hypotheses should be retained. There were no differences between or among respondents with different job titles or between respondents from either four-year or two-year institutions with regard to the question.

Response rates indicated that 87.5% of chief information officers and 86.7% of chief academic officers stated that the strategic plan was often or usually used for guidance in determining what resources to plan for in the technology plan. Deans/directors/coordinators indicated that 62.3% stated that the strategic plan was often or usually used for guidance. Respondents from four-year schools reported a rate of 69.4%, while respondents from two-year schools reported 67.9%. There was a greater than 15.0% response rate for deans/directors/coordinators indicating an uncertainty regarding the value of the strategic plan in providing guidance for the technology plan. Respondents from two-year schools reported a rate of 16.1% of uncertainty.

There were two comments for this question. One indicated that the respondent did not participate in the technology plan. The other indicated that the strategic plan "focuses on desired outcomes, not resource needs."

Findings Related to Research Question 16

Research Question 16, corresponding to survey question 16, asked: To what extent is the office of information technology advised about the goals of the institution stated in the institutional strategic plan? Two hypotheses were developed regarding this question. The first of these hypothesized that there would be no differences between or among respondents with different job titles with regard to the research question. The second hypothesized that there would be no differences between respondents from different types of institutions with regard to the research question.

Results of inferential testing yielded a probability of $p > .05$, indicating that the null hypotheses should be retained. There were no differences between or among respondents with different job titles or between respondents from either four-year or two-year institutions with regard to the question.

Response rates for chief academic officers indicated to a high degree (93.4%) that the office of information technology was considerably or extremely advised about the goals of the institution stated in the institutional strategic plan. Chief information officers reported 87.5%

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and deans/directors/coordinators reported 71.0%. Respondents from four-year institutions reported 77.8%, while respondents from two-year institutions reported 75.0%.

Comments for this question generally indicated that IT personnel were informed regarding the goals of the institution as stated in the institutional strategic plan as were all employees of the institution.

<u>Findings Related to Research Question 17</u>

Research Question 17, corresponding to survey question 17, asked: Is the office of the chief academic officer represented on the information technology planning committee either as a voting or non-voting member? Two hypotheses were developed regarding this question. The first of these hypothesized that there would be no differences between or among respondents with different job titles with regard to the research question. The second hypothesized that there would be no differences between respondents from different types of institutions with regard to the research question.

Results of inferential testing were mixed. Pearson's Chi Square test could not calculate a probability for respondents with different job titles. Most (over 66.0%) indicated in the affirmative for the question. Results of the test between institutions returned a probability of $p >$ .05, indicating that the null hypotheses should be retained. There were no differences between respondents from either four-year or two-year institutions with regard to the question.

Response rates indicated that one third of chief academic officers stated that their office was not represented on the information technology planning committee. Two thirds stated that their office was represented on the committee. Almost 90% of chief information officers (87.5%) stated that the chief academic officer was represented on the strategic planning committee while just less than three fourths (72.5%) of deans/directors/coordinators stated that this was so. Four-year institutions reported that in 86.1% of cases reporting the chief academic officer was represented on the strategic planning committee. Two-year institutions reported a 64.3% affirmative response. Deans/directors/coordinators were unsure in 17.4% of the cases. Respondents from two-year institutions were unsure 17.9% of the time.

Comments for this question generally indicated that personnel representing the chief academic officer, such as deans, served on the information technology planning committee.

<div align="center">Conclusions</div>

Based upon the major findings related to the 17 research questions raised in the study, two distinct categories of conclusions have been drawn. They are listed in the following sections. Following those, three meta-conclusions are stated. These meta-conclusions were drawn from repeated comments from the 17 questions and from high response rates for a particular response. In other words, these meta-conclusions appeared many times in the questions and responses.

Conclusions From Closed-Ended Questions

The following conclusions are based upon response rates from the summary portion of Chapter 4. They reflect differences in response rates that are not significant at the .05 alpha level, but that I think are nonetheless educationally significant. They are as follows:

1. Chief information officers seemed to indicate that the strategic planning document was more useful in achieving institutional vision and mission than did chief academic officers or deans/directors/coordinators.

2. Chief academic officers and chief information officers stated that technology was used as a strategy for achieving institutional goals more than did deans/directors/coordinators.

3. Respondents from four-year schools were more likely to view technology as a strategy for achieving institutional goals than were respondents from two-year schools.

4. Chief academic officers asserted that technology was acknowledged in the strategic plan more than did chief information officers or dean/directors/coordinators.

5. Chief academic officers were more likely to indicate that technology was specifically cited as a strategy for implementing business processes than did chief information officers or deans/directors/coordinators.

6. Chief information officers stated that a technology access fee was specified in the strategic plan as a support for technology more than did chief academic officers or

deans/directors/coordinators.

7. Respondents from four-year institutions stated that a technology access fee was specified in the strategic plan as a support for technology more than did two-year institutions.

8. Chief academic officers and deans/directors/coordinators knew less about the information technology plan than did chief information officers.

9. Chief information officers indicated that their offices are more relied upon than to chief academic officers or deans/directors/coordinators indicated it was.

10. All chief information officers stated that they provided input during the strategic planning process while such was not the case for chief academic officers or deans/directors/coordinators.

11. Chief information officers stated that the strategic plan was helpful in aiding information technology develop its goals more than did chief academic officers or deans/directors/coordinators.

12. Chief academic officers and chief information officers indicated that the office of information technology was advised about goals of the institution more than did deans/directors/coordinators.

13. Chief academic officers and chief information officers seemed to know more about the planning process than did deans/directors/coordinators.

14. Chief information officers seemed to know more about the strategic plan than chief academic officers or deans/directors/coordinators knew about the information technology plan.

Conclusions From Open-Ended Questions

Each of the 17 questions on the survey allowed for comment from participants. In addition, question 18 asked for participants to provide any additional input regarding the linkages between strategic planning and technology planning. The following conclusions were drawn from those responses:

1. The budget drives the planning process. Plans are made and priorities set. At budget

time, money for technology may be cut, but very little change in goals takes place.

2. There is wide support for technology as a means for accomplishing goals. Most believe that its purchase support the goals of the institution.

3. Planning was indicated to not be effective in many institutions.

4. Divisions between/among technology support on some campuses leads to ineffective support of the planning process.

Meta-Conclusions

Three main themes emerged as being important from this study. They are drawn from the conclusions from both closed-ended questions and open-ended comments. They are as follows:

1. The planning process or results of the planning process do not permeate to each level in institutions.

2. Chief information officers know more about strategic planning than chief academic officers or deans/directors/coordinators know about the technology planning process.

3. Technology is acknowledged as furthering the goals of the institution.

Discussion

This study was undertaken to ascertain whether schools in the TBR system used the institutional strategic planning document as a guide when developing an information technology plan. Literature regarding why this was important and how this might be accomplished was reviewed in Chapter 2. Paramount among the recommendations from literature was that the technology plan should be aligned with the institutional strategic plan if it were to succeed and to aid in furthering an institution toward its vision and mission (Boar, 1994; Cassidy, 1998). Research from this study supported the fact that alignment between the two plans was occurring. Respondents indicated that not only was technology used as a strategy for achieving institutional goals, it was acknowledged as such. Additionally, question 6 from the study specifically asked the extent to which the two plans were aligned. Responses demonstrated overwhelmingly that

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they were aligned to a high degree.

Literature indicated that alignment could occur when strategic plans spoke to resources required for successful accomplishment of stated goals (Bryson, 1995; Cook, 1995). Resource needs could be addressed in needs assessments, business process descriptions and/or in strategy formulation. Again, respondents from TBR institutions indicate that such is the case in schools across the state.

Needs assessments should be formal rather than informal or intuitive and should address the gap between an institution's current state and its future desired state (Bryson, 1995; Cook, 1995). This study has found that, for the majority of schools in the TBR system, formal assessment occurred. Question 9 from the survey addressed this issue. Results from respondents indicated that greater than 68.0% determine resource needs using formal methods.

According to Boar (1994) and Cassidy (1998), business processes should reflect the technology needed to bring them to fruition. Each institution should describe the methods and procedures used in registering students, checking out books and other such processes that occur in an institution. Question 4 of the survey instrument addressed this issue and found that over 60.0% stated this to be true at their institution.

Strategy formulation is the development of goals, strategies, and action plans that are developed to guide an institution toward its vision. (Bryson, 1995; Cook, 1995). An institution could specifically cite a goal, strategy or action plan with regard to technology. Representatives from TBR institutions, in reply to question 8, indicated that for many, resource needs were considered during strategy formulation.

<u>Recommendations</u>

This study concludes with recommendations. The first of those are recommendations for further study that would either replicate this study or seek new information to illuminate the study. The second set is recommendations to improve practice in the area of strategic and technology planning. Those recommendations follow.

Recommendations for Further Study

1. This study should be conducted again in the future to see if any changes have occurred with regard to the questions posed here.

2. This study should be conducted in different states to determine how other representatives in different states view the alignment of the technology plan with the institutional strategic plan.

3. This study should be conducted as a qualitative study to discover broad themes present in institutional planning – both strategic planning and technology planning. These themes would reveal other questions that might be asked on a quantitative study such as this.

Recommendations to Improve Practice

1. A study should be conducted to determine the degree to which strategic planning is really strategic.

2. A study should be conducted to determine the depth to which the strategic plan and the information technology plan are communicated within each institution.

3. A study should be conducted to determine the cost to schools for engaging in planning efforts in relation to perceived benefits.

4. A study should be conducted to determine how institutions plan for technology.

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APPENDICES

APPENDIX A

Email Letters To Invited Participants

Dear Invited Participant;

I am a doctoral candidate in Educational Leadership at East Tennessee State University. Dr. Terry Tollefson in the College of Education, Department of Educational Leadership, serves as my advisor. My area of research interest is determining how institutions plan for technology. The questionnaire I have developed to solicit this information asks for information regarding your experiences in strategic planning and in planning for technology at your institution. The pilot study, conducted by several deans and other high-level administrators in the TBR system, revealed that it should take no more than ten minutes of your time to complete.

The results of the questionnaire will be summarized across all institutions and used in my dissertation. Individual answers will be kept strictly confidential and will not be reported as individual responses in my dissertation. I ask that you provide your name at the end of the questionnaire (as a part of question 18) although it is entirely optional. I will use this as a means of sending out follow-up requests for information. If you have supplied your name, I will not send you a follow-up request to complete the survey. Again, let me stress that I will not divulge any information regarding any specific participant or any specific institution.

I am currently teaching Computer Science at St. Edward's University in Austin, Texas, but have spent the past 20 years in schools in the TBR system specifically at Northeast State Technical Community College and East Tennessee State University. I have been involved in both institutional strategic planning and institutional technology planning. I am familiar with the process that takes place for each to be completed in the TBR system.

The questionnaire for this project is an online questionnaire. You can complete it on the web. After you have completed the survey, you will receive a report of your results, which you can then print out. If you would like an executive summary of the results, please contact me via the email that is supplied at the end of the questionnaire. The URL for the questionnaire is: http://www.neowebdev.com/elfox/survey12. It is viewed best in Internet Explorer.

I thank you in advance for the information you provide in helping me complete my doctoral work.

Evelyn L. Fox

St. Edward's University

Austin, Texas

Greetings -

If you have not taken the time to respond to my request for information that will help me complete my doctoral dissertation, I would appreciate your doing so at this time. Remember that the URL is: http://www.neowebdev.com/elfox/survey12. Below is the complete message that I sent originally.

Again, I thank you.

Evelyn L. Fox

Dear Invited Participant;

I am a doctoral candidate in Educational Leadership at East Tennessee State University. Dr. Terry Tollefson in the College of Education, Department of Educational Leadership, serves as my advisor. My area of research interest is determining how institutions plan for technology. The questionnaire I have developed to solicit this information asks for information regarding your experiences in strategic planning and in planning for technology at your institution. The pilot study, conducted by several deans and other high-level administrators in the TBR system, revealed that it should take no more than ten minutes of your time to complete.

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I thank you in advance for the information you provide in helping me complete my doctoral work.

Evelyn L. Fox

St. Edward's University

Austin, Texas

Dear Participant –

Please bear with one more reminder for a request to respond to my doctoral survey. If you have responded, I thank you again; if not, please take a moment now to respond and help improve the credibility of the survey by those responses.

I am especially interested in your input to question #18 concerning your comments with regard to the linkages between the strategic plan and the technology plan at your institution.

The URL is http://www.neowebdev.com/elfox/survey12

Evelyn L. Fox

Dear Invited Participant;

I am a doctoral candidate in Educational Leadership at East Tennessee State University. Dr. Terry Tollefson in the College of Education, Department of Educational Leadership, serves as my advisor. My area of research interest is determining how institutions plan for technology. The questionnaire I have developed to solicit this information asks for information regarding your experiences in strategic planning and in planning for technology at your institution. The pilot study, conducted by several deans and other high-level administrators in the TBR system, revealed that it should take no more than ten minutes of your time to complete.

The results of the questionnaire will be summarized across all institutions and used in my dissertation. Individual answers will be kept strictly confidential and will not be reported as individual responses in my dissertation. I ask that you provide your name at the end of the questionnaire (as a part of question 18) although it is entirely optional. I will use this as a means of sending out follow-up requests for information. If you have supplied your name, I will not send you a follow-up request to complete the survey. Again, let me stress that I will not divulge any information regarding any specific participant or any specific institution.

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both institutional strategic planning and institutional technology planning. I am familiar with the process that takes place for each to be completed in the TBR system.

The questionnaire for this project is an online questionnaire. You can complete it on the web. After you have completed the survey, you will receive a report of your results, which you can then print out. If you would like an executive summary of the results, please contact me via the email that is supplied at the end of the questionnaire. The URL for the questionnaire is: http://www.neowebdev.com/elfox/survey12. It is viewed best in Internet Explorer.

I thank you in advance for the information you provide in helping me complete my doctoral work.

Evelyn L. Fox

St. Edward's University

Austin, Texas

APPENDIX B

Survey Instrument

Strategic Planning For Technology
Dissertation Survey – Evelyn L. Fox

Determining the technology needs of an institution can be an overwhelming process. One way it can be accomplished is to express those needs in the institutional strategic plan. These needs can then be extracted and pursued as needed. The following is a survey that will help determine the extent to which TBR schools use the strategic plan to express technology needs. The results can be of great help to institutions in formulating future technology plans. Please take a few moments of your time to answer the following questions. Pilot studies indicate that the survey should take no more than 10 minutes to complete. I encourage you to make explanatory comments when you believe your answer needs further illumination. Although survey results will be kept strictly confidential, I ask that you sign your name in question 18 so that I may follow up with non-respondents.

Thank you for your help. Your participation is greatly appreciated.

GENERAL DEMOGRAPHICS
1. Do you represent a 2-year or a 4-year institution? Please choose only one.
    - 2-year
    - 4-year

2. Indicate the size of your institution in FTE. Please choose only one.
    - <3,000 FTE
    - 3000-5000 FTE
    - 5001-7500 FTE
    - >7500 FTE

3. Indicate your position within your institution. Please choose only one
    - Chief Information Officer
    - Chief Academic Officer
    - Dean/Director/Coordinator

PLANNING SURVEY QUESTIONS
1. At your institution, to what extent is the strategic planning document helpful in achieving the institutional vision? Please choose only one.
    - not at all
    - moderately
    - unsure
    - considerably
    - extremely

    Comment? _____

2. At your institution, how often is technology used as a strategy for achieving institutional goals? Please choose only one.
   - seldom
   - occasionally
   - unsure
   - often
   - usually

   Comment? _____

3. At your institution, how often is technology acknowledged in the strategic plan and/or its supporting documentation as supporting goals of the institution? Please choose only one.
   - seldom
   - occasionally
   - unsure
   - often
   - usually

   Comment? _____

4. At your institution, how often is technology specifically cited as a strategy for implementing business processes identified in the strategic plan and/or its supporting documentation? (A business process describes how a procedure is carried out such as enrolling a student, checking out a library book, determining financial aid, awarding financial aid, developing curriculum and the like.) Please choose only one.
   - seldom
   - occasionally
   - unsure
   - often
   - usually

   Comment? _____

5. At your institution, does the strategic plan and/or its supporting documentation specify that a technology access fee be used as a strategy for acquiring technology toward the implementation of strategic goals? Please choose only one.
   - no
   - unsure
   - yes

   Comment? _____

6. In your opinion, what is the extent to which the information technology plan is aligned with the institutional strategic plan at your institution? Please choose only one.
   - not at all aligned
   - moderately aligned
   - unsure
   - considerably aligned
   - extremely aligned

   Comment? _____

7. At your institution, in the past year why was technology purchased? Please check all that apply.
   - unsure
   - to implement the strategic plan
   - to replace old equipment
   - to spend available monies
   - other (please specify below)

   Comment? _____

8. At your institution, at what point in the strategic planning process are technology needs generally considered? Please check all that apply.
   - before planning begins
   - after the plan has been completed
   - during the resource-needs analysis phase
   - during strategy formulation
   - technical needs are not considered at planning time
   - other (please specify below)

   Comment? _____

9. At your institution, during the strategic planning process what is the primary way of determining technology resources needed to accomplish the plan? Please choose only one.
   - resources are not determined at the time of planning
   - intuitively (informally)
   - by formal procedure/documentation
   - other (please specify below)

   Comment? _____

10. At your institution, to what extent is the office of information technology relied upon for guidance in helping determine how technology could be used as a strategy to accomplish planning goals? Please choose only one.
- not at all
- moderately
- unsure
- considerably
- extremely

Comment? _____

11. At your institution, to what extent does the office of information technology provide input during the strategic planning process that will help determine the strategies used in accomplishing the goals stated in the institutional strategic plan? Please choose only one.
- not at all
- moderately
- unsure
- considerably
- extremely

Comment? _____

12. At your institution, is the office of chief information officer represented on the strategic planning committee either as a voting or non-voting member? Please choose only one.
- no
- unsure
- yes

Comment? _____

13. At your institution, how often is the strategic planning document and/or its supporting documentation used as a vehicle for communicating the technology needs of the institution? Please choose only one.
- seldom
- occasionally
- unsure
- often
- usually

Comment? _____

14. At your institution, to what extent is the strategic plan and/or its supporting documentation helpful in aiding information technology to develop its goals? Please choose only one.
   - not at all
   - moderately
   - unsure
   - considerably
   - extremely

   Comment? _____

15. At your institution, how often is the institutional strategic plan and/or its supporting documentation used for guidance in determining what to include in the institutional technology plan? Please choose only one.
   - seldom
   - occasionally
   - unsure
   - often
   - usually

   Comment? _____

16. At your institution, to what extent is the office of information technology advised about the goals of the institution stated in the institutional strategic plan? Please choose only one.
   - not at all
   - moderately
   - unsure
   - considerably
   - extremely

   Comment? _____

17. At your institution, is the office of the chief academic officer represented on the information technology planning committee either as a voting or non-voting member? Please choose only one.
   - unsure
   - no
   - yes

   Comment? _____

18. Please provide any information you feel would be helpful in explaining the technology planning process and/or the institutional strategic planning process and their correlation at your institution.

Comment? _____

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Evelyn Leonhardt Fox
100 Harness Lane
Georgetown, Texas 78628
(512) 869-8556

Experience   **St. Edward's University, Austin, Texas**
Instructor

Responsibilities include preparing lectures, presenting course matter to students, evaluating student work, assigning of student grades. Courses taught included Problem solving using a computer, Software Engineering, Senior Seminar and C++ labs. I maintain a web site for student information.

East Tennessee State University, Johnson City, Tennessee
Full-Time Temporary Faculty

Responsibilities include planning and teaching classes in Web Design, Advanced Web Design, and Visual Basic for Applications. I kept up an extensive web site for my students. Additionally, for Spring, 2001, I coordinated—with three adjuncts—the Web Design course.

East Tennessee State University, Johnson City, Tennessee
Doctoral Fellow, Department of Educational Leadership and Policy Analysis (ELPA)

Responsibilities included creation and maintenance of the ELPA web site involving the use of JavaScript, Active Server Pages including database look-up capabilities, and Adobe Acrobat; fellow liaison attending faculty meetings; creation and maintenance of web site for Kellogg grant "Developing Community Leaders for Tomorrow"; serving on steering committee for Kellogg grant "Developing Community Leaders for Tomorrow"; serving on College of Education web site development committee; and team teaching the doctoral class "Strategic Planning and Site-Based Leadership."

Tusculum College, Greeneville, Tennessee
Adjunct Instructor

Responsible for planning and teaching classes in Systems Analysis and Design, Comparative Languages, and Technology Application for Teachers in a block-scheduling program. The Comparative Languages course included work in Visual Basic.

Northeast State Technical Community College
Director of Computer Services

Duties included daily operation of the Computer Services department, supervision of a staff of seven, administering departmental budget, campus-wide strategic planning for technology, and the planning and implementation of new initiatives. A microcomputer network was initiated under my guidance. Two new buildings were wired and brought on-line under my supervision—one involving a WAN incorporating a T1 data line. I developed the configuration for two new main-frame servers that were purchased during my tenure. One server ran the administrative databases while the other server was utilized as a networking and intranet server for the college. I initiated and led the development of the college web site and the college intranet site. The mail server was configured with the capability of displaying personal web pages for all faculty and staff. Dial-in capabilities were being developed as I left the position. The department developed and presented on-going faculty/staff training seminars. I led the department through the development of a mission statement and goals for each employee that were updated yearly.

I served on the Tennessee state-wide committee of Computer Service Directors. The committee advised and made decisions on future direction for technology for the state of Tennessee. My interests were ethics and accountability.

In addition, I chaired the Technology Planning Committee at Northeast State. This committee, formed in April 1995 was responsible for goal setting with regard to the use of technology on campus. The committee developed comprehensive ethics statements, developed applications for the use of the World Wide Web, resolved technical issues, suggested architectural standards and put together a comprehensive survey of campus-wide needs

I served as a member of the President's Planning Committee. This committee was responsible for determining matters of policy and procedure at Northeast State

Northeast State Technical Community College
Director of Educational Services

I assisted the Vice President of Academic Affairs. General duties included: overseeing all class scheduling (using Microsoft Project), overseeing catalog development for all of academics at the college, coordinating all activities relating to academic microcomputers, coordination of Performance Funding initiatives, and maintaining the academic planning calendar—which I initiated.

I was responsible for a week-long faculty in-service each August. I planned and coordinated all activities during this week. I followed the concurrent session approach. Topics included advisories on such diverse topics as harassment in the workplace and health related issues.

For five years I chaired the committee on Academic Advisement. I developed the first Academic Advisement handbook and held workshops to help faculty with advisement issues.

I helped the Vice President in the verification of graduation credentials for all graduates.   I also gave input into the institutional standing committees each year.

I chaired the Academic Computer Planning Committee. I conceived of and chaired this committee that was responsible for the inventory of academic hardware and software. This committee was given the assignment of helping to assign priorities of computer and computer related purchases. It established standards for computing hardware and software.

I developed and kept current a software program that tracked faculty productivity.

I was a member of Academic Council. This council, composed of academic administration, served as an advisory group for the Vice President of Instruction. General policy, procedures and guidelines were discussed and formulated.

Northeast State Technical Community College
Chair, Business Technologies Division

I was responsible for the long-term and daily activities of the Business Technologies division that encompassed the accounting, secretarial, management and computer science departments. General duties included: hiring, supervision and evaluation of ten full-time and numerous adjunct instructors, scheduling of classes, determination of instructor teaching assignments, resolution of student problems and the administration of the departmental budget. In addition, I was responsible for the overall development and currency of the Business Technologies curriculum. I automated curriculum scheduling while in this position.

Northeast State Technical Community College
Instructor/Assistant Professor, Computer and Information Sciences Department

I was responsible for planning, teaching and evaluating students in a variety of courses which included: Concepts, COBOL, Advanced COBOL, BASIC, Pascal, Analysis and Design, LOTUS 1-2-3, Introduction to Business, Business Math, and College Orientation.

I served as Secretary of Faculty Council for a one-year term.

Beecham Laboratories
Scientific Data Programmer

I was a programmer in the scientific data division. Duties included calculation of results on drug usage for Nabumetone using the SAS software program. In addition, I was responsible for developing graphs for the depiction of the results.

East Tennessee State University, Johnson City, Tennessee
Instructor, Computer and Information Sciences Department

I was responsible for preparation, teaching and evaluating students enrolled in courses that I taught in the CSCI department. Courses included FORTRAN, PL/I, Software Engineering and Computer Concepts.

East Tennessee State University, Johnson City, Tennessee
Adjunct Instructor, Computer and Information Sciences Department
Adjunct Instructor, Media Department

I was responsible for preparation, teaching and evaluating students enrolled in courses that I taught in the CSCI department and in the Media department. Courses included Computer Concepts, Pascal, and Media Instruction in the Classroom. I also taught the graduate courses CSCI 5850 and CSCI 5860—Computers in Research.

Texas Department of Education, Bedford and Plano, Texas
Public School Teacher

I was responsible for preparation, teaching and evaluating students in my classroom. I taught 7th grade Texas History for two years and fifth grade general curriculum for five years.

Education

| 1965 | **North Texas State University, Denton, Texas** |
| | *B. S. in Secondary Education with emphasis in integrated social sciences* |

| 1982 | **East Tennessee State University, Johnson City, Tennessee** |
| | *B. S. in Computer and Information Sciences* |

1992	**East Tennessee State University, Johnson City, Tennessee**
	M.S. in Computer and Information Sciences
	Thesis: A Cost Effective Approach Toward the Use of Software in the State of Tennessee; Dr. Terry A. Countermine, Chair

2002	**East Tennessee State University, Johnson City, Tennessee**
	Doctorate in Educational Leadership and Policy Analysis
	Dissertation: A Study Of The Extent To Which Institutional Strategic Planning Serves As A Guide For Technology Planning In Tennessee Board Of Regents Institutions; Dr. Terrence Tollefson, Chair

Other   Member of Upsilon Pi Epsilon, honorary fraternity in Computer Sciences; Member of Kappa Delta Pi, honorary fraternity in Education; Invited member of Who's Who for Women in Technology, 1997. 4.0 GPA in Master's and Doctoral work. Chair of Computer and Information Sciences Department Advisory Committee, 1996 to 2000.

Chosen to serve Northeast State on the Tennessee Board of Regents committee of Academic Policies and Programs, 1992. The committee was charged with the approval and recommendation of academic policies and programs for all TBR institutions.

Trained DACUM (Developing A Curriculum) facilitator, trained by Robert Norris of The Ohio State University, 1992.

Facilitated the development of curriculum for Computer and Information Sciences at Northeast State Technical Community College using the DACUM method, 1993.

Chosen by Northeast State Technical Community College to participate in Middle Tennessee's Annual Leadership Institute, 1996.

Trained Tennessee Quality Award Examiner (TQA) for evaluating performance excellence in business, healthcare and education using the Balridge criteria, 1999.

Conducted TQA assessments in the state of Tennessee, 1999.

Presentations "Performance Funding As It Applies To Two-Year Institutions In Tennessee"; presented at the Fall Meeting of Academic Affairs Administrators, Southeast Region; Nashville, Tennessee; 1994.

"The State of Technology at Northeast State Technical Community College and where should we be heading"; presented to the Management Committee, 1995.

"The State of Technology at Northeast State Technical Community College and where should we be heading: an update"; presented to the Management Committee, 1996.

"The State of Technology at Northeast State Technical Community College and our accomplishments in the preceding year"; presented at in-service, 1996.

"Windows 95: An overview"; presented in Continuing Education Studies at Virginia Highlands Community College, 1999.

How can Excel work for you?"; presented to Virginia Forestry Rangers at Virginia Highlands Community College, 1999.

"Creating a Web Page for Professional Use" presented to ELPA Doctoral Students, 2000.

"Using EndNote As A Professional Resource" presented to ELPA Doctoral Students, 2000.