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A study of the characteristics needed by information technology leaders in faith-based higher education institutions

Donald H. Davis

Pepperdine University

Graduate School of Education and Psychology

A STUDY OF THE CHARACTERISTICS NEEDED BY INFORMATION TECHNOLOGY LEADERS IN FAITH-BASED HIGHER EDUCATION INSTITUTIONS

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Donald H. Davis

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Eric Hamilton, Ph.D. – Dissertation Chairperson

This dissertation, written by

Donald H. Davis

under the guidance of a Faculty Committee and approved by its members, has been submitted to and accepted by the Graduate Faculty in partial fulfillment of the requirements for the degree of

DOCTOR OF EDUCATION

Doctoral Committee:

Eric Hamilton, Ph.D., Chairperson

John McManus, Ph.D.

June Schmieder-Ramirez, Ph.D.

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VITA

Professional Experience

Azusa Pacific University College, Glendora CA. (2010-Present)
Vice President / Chief Operations Officer

Azusa Pacific University, Azusa, CA. (1989 – Present)
Vice President / Chief Information Officer (2012-Present)
Associate Vice President / Chief Information Officer (2007-2012)
Executive Director / Deputy Chief Information Officer (2003-2007)
Director, Collaborative Technology (2000-2003)
Director, Instructional Technologies and Media Services (1995-2000)
Director of Audio Visual Services (1990-1995)
Media Services Supervisor (1989-1990)

Azusa Pacific University, Azusa, CA. (1991-2002)
Adjunct Professor, School of Business
Classes taught include:

- Bus514 - Management of Technology
- MIS346 - Systems Design
- MIS240 - Introduction to Information Systems
- MIS345 - Computer Programming I - QBasic and Visual Basic

Professional Activities

Presenter, *Achieving Operational Excellence through Innovative IT Strategies.* University Business and Jenzabar Webinar, (2014)

Presenter, *Extending My IT Department through the Cloud.* EDUCAUSE Enterprise IT Leadership Conference , St Louis, MO (2013)

Presenter, *Extending Your IT Staff: Off-Load the Right Projects and Deliver Quality Support.* EDUCAUSE Annual conference, Denver, CO (2012). Jenzabar Webinar (2012).

Presenter, *Organizational Structure: A commitment to purpose and action.* Council for Christian Colleges and Universities IT conference , St Paul, MN (2010)

Presenter, *Architectural Planning or Chaotic Thinking: Creating a Roadmap.* Bi-Tech Higher Education Customer Summit, San Antonio, TX. (2006)

Presenter, *Azusa Pacific University Migration Story: 9 months to deliver.* Higher Education Software Users Association, San Antonio, TX. (2003)

Presenter, *Coca-Cola: Internet Based Computer Research.* Coca-Cola National Account Executives and Business Development Manager leadership training, Irvine, CA. (2001)

Presenter, *Technology in Search of Instruction or visa-versa.* Council for Christian Colleges and Universities IT conference, Azusa CA. (2000)

Participant, Christian Leadership Alliance conference, Dallas, TX (2011)

Participant, EDUCAUSE Annual conference (1999-present). Conference adjunct reader (2004)

Participant, American Association for Higher Education, Generating a Sustainable Institutional Commitment to Assessing student learning. MD (2003)

Participant, EDUCAUSE sponsored Internet II workshops. Washington DC. By invitation only (1999)

Participant, American Association for Higher Education, Teaching, Learning, Technology Roundtable Program, Fresno, CA (1996)

Community activities

Charter Oak Unified School District, Covina, CA.

Governing Board - Member (2009-Present) / Vice-President (2013) / President (2014)
District Technology Executive Committee Member (2009-Present)

Christ Community Church, West Covina, Ca.

Media and Production Director (1994-Present)
Children's Ministry Director (2011-Present)
Children's Ministry Teacher (2006-Present)

Citrus Community College, Glendora, CA.

IT Advisory Council Member (2008-2010)

Education

Doctor of Educational in Learning Technologies
Pepperdine University, Los Angeles, CA (2015)

Masters of Business Administration in Strategic Planning Emphasis,
Azusa Pacific University, Azusa, CA. (1994)

Bachelor of Science in Management Information Systems,
Azusa Pacific University, Azusa, CA. (1989)

ABSTRACT

The role of the CIO at a faith-based institution is both complex and one that continues to evolve. It is impacted by advances in technology, higher education and institutional culture, views on technology, the strategic use of technology and information, and the faith values of the school. A group of 27 CIOs at institutions within the Council for Christian Colleges & Universities (CCCU) throughout the United States participated in a self-administered online survey providing demographic information and their perceptions on characteristics needed for current and future success. This descriptive quantitative research study determined the characteristics an effective CIO at a faith-based college or university needs and evaluated the impact organizational design has on both the CIO role and these critical characteristics. The results of this study indicate that reporting structure, size of institution, and age impacted both the CIO role and the critical characteristics needed for CCCU CIOs over the next twenty years. This study provides recommendations to assist CIOs within the CCCU to evolve the CIO role to further their institution in realizing its goals and mission. The recommendations include: modifying CIO development and recruitment strategies; positioning IT strategically within the organization; changing CIO mindset in order to be a visionary; and aiming to be a strategist balanced with solid operations.

Chapter 1: Introduction

The chief information officer (CIO) role in higher education recently celebrated its silver anniversary. It should be a time to celebrate. For the CIO it may be a short celebration, however. CIO responsibilities over the past 10 years have continuously expanded as the dynamics and demands of the business climate and world have changed drastically. Technological advances over the past decade have also contributed to expanding the CIO's role. According to a 2009 IBM study, "The new voice of the CIO: Insight from the global chief information officer study", CIOs spend fifty-five percent of their time innovating the business with technology. The CIO role dates back to the early 1980's as Vice Presidents of Information Technology began to carry a C-executive role with their title. The acceptance as a C-executive evolved as the awareness that information needed to be managed as a resource increased. William R Synnott and William H Gruber (1981) in their book, *Information Resource Management,* coined the term chief information officer and defined it as "the senior executive responsible for establishing corporate information policy, standards, and management control over all corporate information resources" (p . 66). The design of the role was to be as follows:

- A member of the senior administrative team
- A manager of the technology and information resources
- The individual responsible for IT planning
- The individual responsible for IT policy development, and
- A participant in the overall institutional strategic planning process

In the late 1980's the CIO role evolved as technology began to drive business process change. In the late 1990's, with the spread of internet technologies and the rapid rise of "e-business" initiatives, the role shifted to implementing enterprise management systems. Today, the CIO is challenged to deliver value to the organization through technology-enabled new services or products; while simultaneously controlling or reducing costs, in a changing climate of increasing

government and auditor regulations. Synnott (1987) states, the CIO is a "businessman first, manager second, and technologist third." Information technology is transforming the way organizations function and can be found in almost all industries and businesses, including higher education. Since its inception, the CIO leadership role continues to change as the use of technology advances, evolving from a technical service position overseeing technology, to a more sophisticated and demanding role of strategist and executive. CIOs are also seeing their roles expand to include new responsibilities such as facility management and online learning.

Today, some 30 years later, the struggle continues for the CIO to balance the two primary roles of technologist (operations) and business executive (strategy) successfully. Recent literature affirms that a successful CIO must add value to the organization by balancing time between operational credibility and strategic thought. Broadbent and Kitzis (2005) use the economic terms of supply and demand to discuss this issue. They state CIOs must balance their two primary roles between operations (supply) and strategy (demand). Over the years technology and its use have shifted from data processing to an integral part of operations, and so have the skills needed to lead the change.

Since its inception, the CIO role has evolved as the environment changed and the demand for technology increased. In the late 1980s, CIO's began to lead the business process change (re-engineering) wave, often times with a focus on automation in order to downsize and cut costs. In the late 1990s, with the spread of the Internet, web technologies, and the explosion of e-business initiatives, the role shifted to implementing and managing enterprise systems (student systems in higher education) and customer relationship management systems. Today, the CIO is challenged to deliver organizational value through technology by providing effective and new services or products while simultaneously controlling costs.

CIO responsibilities over the past 10 years have continued to expand within a business climate and world characterized by drastic change. An example of this dynamic change is increasing governmental regulation concurrent with the increasing commoditization of technology—especially personal technology. This juxtaposition is best seen with the emergence of mobile technology such as smartphones and tablets. Since September 11, 2001, the increase in government regulations—especially concerning privacy of data with such legislative as Graham-Leach-Bliley Act, Freedom of Information Act, Family Education Rights and Privacy Act (FERPA), and most recently Higher Education Opportunity Act—has resulted in the increased need to secure personal information. Regulations have increased the demand for resources to meet these policies. At the same time, advances in mobile technologies have increased connectivity as users are seeking increased access to institutional data. The combination of needing to provide stronger data security while allowing increased access to the information has created new challenges and complexities. Another example of this dynamic change is in report production. Historically, reports were created and run by the IT department. Today, software and analytic tools are available for functional departments to create and run their own reports. This evolution established reports, dashboards, and business intelligence as an on-demand service. On-demand service is viewed as a competitive advantage by the organization.

The CIO role continues to expand as the demand for use of information and technology continues to increase. For instance, technology has changed the way organizations and individuals communicate with each other, through new means such as text messaging, video conferencing and social networks such as Facebook or Twitter. These advances in communication tools have shrunk the world and have added a level of complexity, putting new

demands on leaders (Wieand, Birchfield, & Johnson, 2008). As technology continues to evolve the role of the chief information officer (CIO) must also evolve.

The complexity of globalization and technology is also putting new demands on business leaders. The same is true in higher education, as technology has become critical to higher education operations. Adoption of technology on campuses has expanded the borders of higher education institutions, through online classes and degrees, online open courses and badges, study abroad programs, online student service delivery (e.g., class registration, add/drop and online payments), and the availability of online library resources and services. The evolution of communication tools, as previously mentioned on page 14, provides a technology example of how advancement of new tools adds a new dimension of leadership complexity. This complexity requires additional leadership skills to navigate the increasing demand of each tool, both in terms of technical and managerial (i.e., policy development).

Organizations are designed based on factors such as purpose, culture, strategy, structure, people and processes (Goold & Campbell, 2002). This study focused on the relationship of culture and structure and the CIO's leadership characteristics. Literature suggests that culture (both national and corporate), influences leadership characteristics (style) and that certain leadership attributes work better in certain cultures (House, Hanges, Javidan, Dorfin, & Gupta, 2004). For higher education, culture is based on its mission to educate and its purpose to disseminate knowledge which leads to an open collaborative environment. Bothum (1999) describes higher education as serving as the "center for innovation with a positive and long-lasting influence on all of society" (page 1). Faith-based colleges and universities are even more unique as their culture may be influenced by denominational affiliation or the belief in the development of the whole person ---spiritually, academically, emotionally and socially. Even

within faith-based institutions each school sees their mission uniquely, as their formation and purpose have been influenced by denominational relationships or historical charter. Faith-based institutions were often founded with close ties to denominations, and frequently the organization reflects the values and traits of the founder. Many faith-based institutions are impacted by the founding organizational tenets influencing the values, beliefs, and structure at the institution. Stogdill and Shartle (1948) state that organizational culture influences organizational structure; their research studied the importance of the location of the executive's position on the organization chart. One attribute identified in literature is the impact organizational structure (reporting structure) has on the CIO's success (Peppard, 2010).

The leadership challenges of the CIO role seem to be independent of industry; what tends to change is the complexity and scope of the demands as well as the culture of the industry. The unique culture of higher education (and even more pronounced culture of faith-based institutions), provides different leadership challenges for the CIO in higher education (Burns, 2012; Williams, 2010). The collaborative spirit, the consensus decision making approach, and open nature of higher education can, among other issues, lead to slower decision-making. For the CIO, a slower decision-making process adversely affects the critical planning stages, when adopting new technologies. The CIO role is not exclusively about technology itself; rather, it is about the ability of a campus to achieve its goals and objectives through technology by working with peers, collaborating and developing a shared information technology vision.

Problem Statement

Impacting the role of the CIO at a faith-based institution is the evolving role of the CIO, advances in technology, higher education and institutional culture, views on technology, the

strategic use of technology and information, and the faith values of the school. Another dimension that might impact the CIO role is the denominational affiliation influence on institutional culture. Determining which characteristics are critical to be an effective CIO at a faith-based college or university, and determining if denominational affiliation influences the leader's characteristics are the prevailing need. Recent studies (Allison, 2010; Brown, 2009) compound the need by indicating that the first generation of CIOs plan to retire within the next 10 years. This is significant as the literature reveals that the role of the CIO is both complex and lacking clarity with regards to its career path, thus it is questionable how leaders will emerge to replace these CIO retirees. CIOs need new skills to succeed in their evolving role. The literature revealed a divergent viewpoint on skills needed with no specific set of characteristics needed for a CIO to be successful. Kitzis (2003) and Peppard (2010) suggest four common attributes, however -- communication (including listening), setting strategy, collaboration and delivery of service.

Purpose

The purpose of this study was to determine which characteristics an effective CIO at a faith-based college or university needs, to evaluate the impact organizational design had on the CIO role and these critical characteristics, and to determine if denominational affiliation influenced these necessary attributes. This descriptive study focused on the leadership characteristics of the senior IT leaders from the Council for Christian Colleges and Universities (CCCU, n.d.).

Research Objectives and Research Questions

With the need to identify and clarify a pathway for current and aspiring CIOs within the CCCU, by determining the critical characteristics needed for success and discovering any institutional factors that impact these characteristics, this study aimed to address the following research objectives:

- Determine the critical characteristics of CIOs at CCCU institutions
- Determine how denominational affiliations influence reporting structure at CCCU institutions
- Determine if organizational demographics impact CIO characteristics at CCCU institutions

Specifically, this study sought to address the following research questions:

1. What is the current state of the CIO in regards to reporting structure and title of the CIO?
2. What are the current self-reported characteristics of CIOs at CCCU institutions?
3. How does size and reporting structure of the institution impact CCCU CIO characteristics?
4. How do organizational demographics impact the state of the CIO in regards to reporting structure and title of the CIO?

Significance of the Study

The role of the CIO is complex, evolving and lacking clarity with regards to its career path, especially when compared to the relatively clear, defined path for other C-level positions. It is important to help clarify the pathway for leaders aspiring to be CIOs. The evolving nature of the role means new skills are needed to succeed. It was necessary to determine the critical

attributes needed to be a successful CIO. By identifying and clarifying the desirable needed characteristics, CIOs can effectively meet their institutional mission.

This was a descriptive study to determine needed CIO characteristics and to evaluate the impact organizational design had on these characteristics. This research was significant since the current literature provided a divergent view of necessary characteristics needed to be successful. The findings of this study proved to be directly helpful in shaping the role and assist in the development of CIOs, future CIOs and their responsibilities. Also, given the significance of the CIOs role in an institutions ability to accomplish vision and strategy through the use of information and technology, the findings from the current study are significant in the hiring process for recruiting and identifying prospective CIOs. The study clarified and identified the desirable characteristics for the CIO role.

Limitations

The study has the following limitations:

1. The study was limited to senior IT leaders at faith-based institutions, specifically United States members of the Council for Christian Colleges& Universities .
2. The study examined only the subset of characteristics identified in the literature describing CIOs not all potential characteristics.

Definition of Operational Terms

- *Characteristics.* A distinguishing quality, attribute, or trait (Characteristics, n.d.)

- *Chief Information Officer* (CIO). Senior information technology leader responsible for information technology policies and standards, technology operations, and all institutional information resources (Synnott & Gruber, 1981)
- *Council for Christian Colleges& Universities* (CCCU). "CCCU is an international association of intentionally Christ-centered colleges and universities. Founded in 1976 with 38 members, the Council has grown to 120 members in North America and 56 affiliate institutions in 19 countries. The CCCU is a tax-exempt 501(c)(3) nonprofit organization headquartered in the Historic Capitol Hill district of Washington, D.C." (CCCU.org, n.d.)
- *Faith-based.* A term used to describe a religious organization like a church. For this proposal it refers to a religious higher-educational institution.
- *Structure.* The reporting structure of the institution often referred to as the organizational chart.

Chapter 2: Literature Review

The role of information technology leadership continues to evolve as technology evolves. Information technology (IT) is used in almost all industries and businesses, including higher education. Technology is transforming the way organizations function and may be the largest single influence on organizational structure. Technology in the workplace has led to redesigned jobs, reduced the physical space needed to perform tasks, allowed for new work environments such as telecommuting and open-plan offices, based on landscape furniture and without walls (Davis, Leach, & Clegg, 2011).

The use of technology has advanced automation in fields as architecture with 3D modeling and computer assisted design, and inventory and logistics management through the use of electronic tags and identification. Information technology has also changed the way organizations and individuals communicate with each other through means such as text and instant messaging, video conferencing and social networks such as blogs, Facebook, or Twitter (Turner, Qvarfordt, Biehl, Golovchinsky, & Back, 2010). These advances in technology and communication tools have shrunk the world in which we live and added a level of complexity which is putting new demands on leaders (Wieand, et. al., 2008). As technology continues to evolve the role of the chief information officer (CIO) must also evolve.

This literature review has two fundamental sections -- the role of the CIO, and organizational design. Each section begins with a broad overview of the topic, and then narrows to the purpose of this study. For instance, the role of the CIO section will begins with the history of the role, investigates the impact of this role in the business arena, and then concludes with the impact of the CIO role in higher education.

Defining different aspects of organizational design is addressed first in the organizational design section. The influence values and beliefs have on organizational culture are then discussed, followed by a discussion on how organizational culture impacts leadership style. The organizational design section concludes by focusing on the particular cultural influence on the leader of denominational affiliation. This approach was selected specifically for the organizational design section, as higher education clearly has a culture of its own. In fact, many would agree that faith-based higher education institutions are even more unique than institutions of higher education as a whole. Limited literature specifically addressing denominational influence on leadership style is an additional factor in defining organizational design.

Role of the Chief Information Officer

Information technology is changing and the CIO is at the center of this shift. As Chapter 1 notes, the CIO role has expanded from being a technology position to that of a strategist and executive. The way CIOs lead requires change as technology has become an integral part of the business. Today, more than ever before, the CIO must successfully balance their two primary roles as technologist and business person. A successful CIO must demonstrate balance by attending to operational execution, which is now tied to business value, while staying focused on strategic business initiatives. The CIO role has evolved from managing to leading, and now includes strategic planning, contract and vendor negotiation, change management, business planning, and governance (Bassellier & Benbasat, 2004; Jones, 2012; Rohmeyer & Ben-Zvi, 2012). The role is thus evolving as the enabler of change, a broker of sort. This role is important as the technology organization serves all functional areas of the organization. As an enabler of change, the CIO needs to be able to lead with agility, innovation, flexibility, and collaboration, while developing a technology department that emulates these same traits. The dilemma is the

need to shift from being reactive to being strategically proactive. This requires a new mindset which moves the CIO from a position of control to a person of influence. The shift to becoming strategic is best described throughout the literature as the need for information technology to add value to the organization. Adding value is accomplished by supporting the organizational mission and focusing on tangible use of technology and information to make informed business decisions. Chester (2011) defines value as the difference between things that are important and things that have transformative potential. Marchard (2008) clarifies this point by explaining that the management of information and technology must be within the context of the business priorities and operations.

The concept of adding value requires both strategic thought and operational credibility. Broadbent and Kitzis (2005) use an economic term—supply and demand—to discuss the CIO's two primary roles and the need to provide balance between operations (supply) and strategy (demand). They state that the CIO's primary roles are shifting to identifying institutional needs, developing strategies, monitoring industry trends to develop IT guidelines, and setting IT priorities to focus on these needs (Broadbent & Kitzis, 2005). An effective CIO will demonstrate balance between demand-side and supply-side leadership. This balance is critical to the success of the organization, because an unbalanced focus on either side can create a vacuum on the other side producing a problem for the organization. Demand-side leadership is defined as the role of shaping and managing informed expectations through determining the demand of information and technology (Broadbent & Kitzis, 2005). This is a process of working with senior management to set organization strategy and identify the value-add technology can provide as expected by colleagues. From an information technology management perspective, this requires focusing on IT architecture and organizational technology projects. Demand-side

leadership focuses on the needs of the enterprise and the ways technology and information can enable the enterprise to achieve strategic goals and fill its persistent business needs, creating value through the use of technology. The focus is on business-IT alignment, uncovering technology-enabled business opportunities within the enterprise and finding ways for IT to streamline the business processes. Supply-side is defined as the cost-effective services provided by the technology department (Broadbent & Kitzis, 2005). That is leading one's team to deliver the promises made on the demand side. Supply-side leadership is leading the technology department to deliver on the services/products needed by the organization. The leader who focuses on demand side is considered a strategic leader, while an individual who concentrates on supply-side is viewed as a tactical leader. Chen, Preston, and Xia (2010) in their research argue that supply-side and demand-side leadership is a staged maturity model. They state that the supply-side leader tends to focus on managing the IT function to deliver cost-effective services; while the demand-side leader partners with the business to focus on innovation and business change. The literature did not reveal which leadership, supply-side or demand-side, has more impact on the outcomes of an organization.

CIO Role in Higher Education. As technology is changing how businesses interact with each other and their customers, it is also having an enormous impact on every dimension of college and university life (Altbach, Reisberg, & Rumbley, 2009; Hawkins & Marcum, 2002). Adoption of technology on campuses has occurred across the globe as evidenced by the use of technology in teaching – both in the classroom and online, delivering online student services like class registration and online payment, and the availability of online library resources and services. Advances in technology are driving emergence of open educational resources and free

access to courses. Technology has become critical to the culture and operations of higher education (Bergquist & Pawlak, 2008).

Higher education historically has had two primary purposes: student learning and knowledge generation and dissemination, while serving as the "center for innovation with a positive and long-lasting influence on all of society" (Bothun, 1999, p. 1). As stated earlier, the complexity of globalization and technology is putting new demands on business leaders. The same is true in higher education. An example of the new demands in higher education includes the need to extend technology support beyond the central campus to "locations" such as remote campuses, study abroad programs, online programs and degrees (Altbach, et.al., 2009), and collaborative research (Brown, Dennis, & Venkatesh, 2010). A quick snapshot of the evolution of communication tools—telephone, email, web pages, text messaging, social networks, document collaboration—provides a technology example of how the complexity of each new tool requires different leadership skills to handle the increasing demand of each tool.

The role of the CIO in higher education has mirrored the role in business in some respects; still, there are unique differences to the role of the CIO in these environments. The complexity, scope of demands, and culture of the industry are obviously dependent on the industry, but the intensity of leadership challenges of the CIO role seems to be independent of industry (Hunter, 2010). The adoption of the CIO role in higher education has grown over the past 9 years. According to a 2011 EDUCAUSE Center For Applied Research study, about 45% of the most senior IT leaders had CIO as part of their titles, in contrast to about 28% in 2002. Slightly more than 30% of the participants reported to the president, an increase of 3% in the past five years, with almost 50% serving on the president's council, an increase of about 7% since 2002 (Hawkins & Rudy, 2007). The percentage of CIOs in higher education lags behind other

industries as reported by CIO.com's State of the CIO 2008 survey which indicated 60% of heads of IT organizations have the CIO title, as compared to 49% in 2004. The same survey stated 41% of the CIOs reported to CEOs/presidents (CIO staff, 2007).

The strategic technology challenges for higher education and IT leaders are reported each year from two different organizations through surveys of higher education CIOs. Each year since 2000, a standing committee called Current Issues Committee from EDUCAUSE, a nonprofit group that advances higher education by promoting the use of information technology, has analyzed current challenges and future trends facing higher education CIOs resulting in an annual current issues report. The top three most strategic IT issues since 2003 have remained consistent, although in different order each year. These are 1) Security; 2) ERP (student information systems), and 3) Funding of IT (Allison & DeBlois, 2008). Since 1993, Kenneth Green has produced the Campus Computing report based on a longitudinal survey of CIOs. Table 1 represents the top three issues confronting higher education CIOs between 2000 and 2008, according to Campus Computing.

After a decade of "stable" issues, with the top issues typically the same as illustrated in Table 1, there was a shift according to the 2010 Campus Computing Survey, where "no single most important" issue was identified. Each sector, as defined by Carnegie classification, of higher education identified a different most important issue. Although no single issue was reported as a result of the 2010 survey, issues were found to be similar to those reported over the past decade, (with the exception of distance education at private universities). The 2012 report again brought to light the need for universities to provide better support and assistance for faculty in their efforts to integrate technology into their curriculum. The EDUCAUSE annual top 10 IT issues echoed this in their 2012 report. The methodology changed slightly by using

Table 1.

The Single Most Important IT Issues Confronting Institutions over the Next Two-Three Years

2000	2001	2002	2003	2004	2005	2006	2007	2008
Instructional Integration (40.5%)	Instructional Integration (31.5%)	Instructional Integration (24.3%)	Instructional Integration (21.4%)	Network & Data Security (21.6%)	Network & Data Security (30.0%)	Network & Data Security (29.5%)	Network & Data Security (25.5%)	Network & Data Security (20.3%)
User Support (22.3%)	User Support (15.4%)	Upgrade/ Replace ERP (18.9%)	Upgrade/ Replace ERP (17.6%)	Instructional Integration (18.5%)	Instructional Integration (17.3%)	Instructional Integration (17.3%)	Upgrade/ Replace ERP (13.0%)	Hiring/ Retention IT Staff (16.7%)
Financing IT (14.6%)	Upgrade/ Replace ERP (12.6%)	Financing IT (15.1%)	Financing IT (16.1%)	Upgrade/ Replace ERP (17.2%)	Upgrade/ Replace ERP (16.1%	Upgrade/ Replace ERP (16.3%)	Hiring/ Retention IT Staff (12.3%)	Instructional Integration (11.9%)

source: The 2008 Campus Computing Survey www.campuscomputing.net

task forces to identify and prioritize top issues. The issues identified were different after the previous 12 years of consistency. Only two of the 2012 top-ten issues map cleanly onto previous years' lists. They are as follows: 1) funding information technology strategically; and 2) establishing and implementing IT governance throughout the institution. The shift was from infrastructure type issues to how technology can support the institution. The issues ranged from using data to drive decision making and the use of analytics to improve operational efficiency. Also listed was transforming the institution through the use of consumerized technology and services such as cloud technologies, mobile technologies, and bring your own device (BYOD) practices. The shift in IT issues after over a decade of *stability* demonstrates the ever changing complexity of the landscape the CIO must navigate.

On the operations front, both reports identified security as one of the top strategic issues over the past decade. The new government regulations concerning security and privacy are a real concern for higher education and increase in complexity in the open collaborative culture of higher education. The business practice whereby an organization can lock down a computer and not allow a user to install software or store data on the local hardware is generally not a viable solution in higher education. Faculty members perceive the lack of ability to use textbook provided software to teach their classes as poor customer service. Often times in higher education a solution is as much about training as it is technical. Another cultural technical difference is the support of a single computer platform. While businesses, especially larger enterprises, can dictate the use of a single computer platform, often Windows, this is not the case in higher education. IT departments in higher education tend to support at least Windows and Macintosh computers, and often Linux is also part of the support matrix. This is partially due to culture and partially due to the various disciplines taught at an institution.

Higher education has a unique culture based on its mission to educate and its purpose to disseminate knowledge which leads to an open collaborative environment. The decision making process in higher education tends to be more consensus-driven and collaborative than the decision making process in business. This collaborative spirit can lead to slower decision making; consequently, adopting new technologies typically takes longer to implement. The business reason for new initiatives is often intangible benefits such as increased mobility, better collaboration, or improved retention. This is a challenge for technology decisions, especially funding initiatives where business technology purchases are often driven by return on investment, while in higher education the benefits are often more intangible than tangible. It is important for new initiatives to demonstrate a return on investment; the return might be in a non-measurable attribute versus improvement to financial bottom line, however. An example is intuitions that have implemented wireless across their campuses. The return may be in ubiquitous access or a useful recruitment tool instead of a cost saving initiative. Information technology tools in higher education at times do not reduce cost or increase revenue but rather promote an intangible benefit that enhances the classroom experience or research. The current economic situation has presented new challenges, resulting in budget cuts and the need to find new initiatives to increase revenues. New initiatives must reduce cost, without cutting services. Successful strategies include the use of e-business tools to improve efficiencies (expense reports and online timecards) and shifts in online learning and pedagogy such as game-based learning and mobile applications (Johnson, Adams, & Cummins, 2012).

Another unique aspect of managing technology in the higher education arena is the different groups that the technology department must support—faculty, staff, students, parents, donors, board members, and alumni. Each group has their own uniqueness, challenges, and

complexity which require different levels of support and at times different policies. For instance, faculty must weigh the value of technology when introducing it in their classes. The primary purpose of the classroom is for learning, so anything that distracts from this purpose can be seen as disruptive. When members of the faculty initiate new technologies into the learning process the technologies must add value by increasing the learning or communication process.

There are several examples illustrating how student support has changed over the past 15 years; however, two specific examples provide insight into the changing complexity and demand of IT leadership. The first is the help desk or support desk model. IT did not interact directly with students 15 years ago; today, the IT help desk has longer hours of operation than the university library, and thus more readily available to students. It is becoming the central place for student assistance, independent of the nature of their questions.

A few institutions, 7% according to 2007 CDS, now have a 24 hour by 7 day support desk (Hawkins & Rudy, 2007). The help desk is evolving from a call center for just technology questions to a call center for institutional service questions (Miller, 2002). Haas and Stillwell (2010) described the expanding role of the IT support desk, through the emerging partnership of a combined library and IT support desk. Another example of the expanded support desk model for institutional service is for distance education service support. Universities have begun forming centralized institutional support desks for administrative services and support (Wiggins, 2011).

Institutions serve as the local internet service provider (ISP), especially for residential students. The need to provide adequate bandwidth to students continues to challenge higher education institutions. Over the past 10 years, bandwidth has consistently been increased so students have adequate connection speed even if the majority of use is for non-academic

activities. The service is provided since residential students represent a significant contingent of the IT department's customers. Complicating the bandwidth issue is the recent passage of the Higher Education Opportunity Act, requiring institutions to monitor illegal activity—downloading of illegal music and videos—and to disable accounts based on any illegible activity. This new legislature required the implementation of new service, and the development of new policies and new procedures to accommodate the new requirement. A unique difference between higher education and a faith-based higher education institution is the belief that the mission of faith-based higher education is to develop the whole person spiritually, academically, emotionally, and socially. Consequently, IT, within the context of faith-based higher education, has an added responsibility to support the mission of the institution providing increased oversight by blocking inappropriate internet sites, such as pornography or gambling, and collaborating with student life to assist with teachable moments to educate students on appropriate use of technology.

The increase in need for physical safety has added complexity to the support of technology on college campuses. The need to contact students in real time in the event of an emergency has made the addition of public address systems and reverse-911 or e-notification systems to the campus technology service portfolio essential. The e-notification system is an example where the installation of the technology was the easy part; the difficult part was the creation and approval of the policies to govern the service. For instance, the following questions had to be addressed before the system was implemented: Do students opt-in or opt-out of the system? Is it tied to the student information system? What constitutes an emergency that activates the system?

One example that crosses all groups is the adoption of cloud computing, mobile devices, bring-your-own-device, and social network consumer technologies. Support for each of the groups varies. Faculty or departments need to integrate web-based software solutions to meet specific needs and have these applications seamlessly integrated with the existing enterprise software and infrastructure. Students want to use mobile technology to access university services such as class materials and online courses, or to make purchases on campus (Carrol, Howard, Vetere, Peck, & Murphy, 2002; Looi, Seow, Zhang, So, Chen, & Wong, 2010). Another example of how the different groups view the same technology may be the concept of classroom capture systems—the ability to capture audio and/or video of the lecture with presentation materials. Students are pushing for classroom lectures to be captured and made available, not so they can miss class, but so that they can listen to the lecture at a later time, perhaps as they study for a test or final (Dey, Burn, & Gerdes, 2009). Faculty tend to be reluctant to employ such technology due to intellectual property issues and perception the technology is difficult to use. The IT department is tasked with supporting and promoting such innovations.

The CIO role in higher education is relatively new, especially when compared to roles of executive peers, and lacks some clarity as to the primary function of the role most notably within higher education. The CIO role is evolving as the use of technology evolves. The role needs to be one of a strategist focusing on using technology to add value to the organization. The role is not about technology itself; rather, it is about the ability of a campus to achieve its goals and objectives through technology. In *State of the CIO: The changing CIO Role,* Holmes perhaps states it best, “successful CIOs today need to have their heads into strategy but their feet firmly planted in good execution (2006, p. 4). Successful CIOs must transition the mindset of their

teams from being service providers to being enablers of innovation. The challenge for the higher education CIO is to develop strategies that allow integration of new technologies as quickly as possible in a traditionally slow culture.

Attributes of an Effective CIO. The CIO role from its inception has been about making it all come together: people, management, information resources, strategy, and technology (Synnott, 1987). As the popularity and use of technology; and the shared use of technology by all stakeholders increases, the need to manage information technology as a critical organizational resource calls for new leadership characteristics for the CIO. The current literature suggests new leadership models or competencies (skills) are needed to succeed in the 21st century (Broadbent & Kitzis, 2004; Hawkins & Marcum, 2002). As technology continues to evolve the role of the chief information officer must also evolve.

The literature revealed various examples of what characteristics successful CIOs need but did not reveal any specific characteristics for a CIO to be successful (see Table 2). However, there were some common themes such as communication (including listening), setting strategy and vision, and forming partnerships.

The following section of the literature review outlines sets of revealed attributes connected to effectiveness that the new CIO leader needs. Today's CIO relies on a multitude set of skills to help foster institutional change, improve operational processes, and enhance customer services. The attributes described focus on the need to provide balance between strategy and operations by building credibility through effective management IT resources, gaining business relevance by using technology to enabling business change, and having impact by being a strategic business partner

Table 2.

CIO Characteristics (Attributes) Identified by Authors

	Vision / Trends/ Strategic Planning	Hard Decisions	Communication Skills	Reporting Structure	Partner / Alliances / Relationship	Manage Resources / Organize	IT Knowledge	Political Savy	Business Knowledge	Education	Measure	Deliver Services	Change Agent	Personnel Development	Leadership/Lead/ Inspire Others	Negotiations	Budget	Project Management
Fleit (1988)	X	X	X		X	X	X											
Brown (2009)			X	X			X	X	X	X								
Kitzis (2003)	X		X		X	X					X	X						
Synnot (1987)	X			X					X			X	X					
Beatty, et al (2005)	X								X			X		X				
Remenyi, et. al. (2005)	X						X		X	X								
Waller, et. al. (2010)	X		X		X									X	X			
Arroway, et. al. (2011)	X		X		X		X		X						X	X	X	X

Marchard (2008) states the CIO's leadership role should include the following attributes: 1) being an effective leader in the institution; 2) collaborating with peers to influence IT-enabled process; and 3) being a member of the senior management team. The *2009 Higher Education Chief Information Officer Roles and Effectiveness* study by Brown (2009) identified six CIO attributes that when matched to the organizational environment may predict the success of the CIO to deliver mission-critical IT services for the success of the institution. The significance of the research is that it began as a dissertation and is now a longitudinal research project, having just completed its fifth year. This study is unique as it surveys the effectiveness of the CIO through self-evaluation as well as through surveying the management team (peers) of the CIO and then comparing the two responses. The six attributes Brown (2009) identified are communication skills, political savvy, IT knowledge, strategic business knowledge, education, and reporting structure. Kitzis (2003) provides six imperatives that define the CIO's role; and are a part of the Gartner CIO academy:

1) LEAD - bridge business and technology: The primary job of the CIO is to drive business growth using technology. The need to articulate a clear vision
2) ANTICIPATE - sense key trends: The demonstration of how information and technology is leveraged to meet organizational objectives
3) STRATEGIC - Shaping demand and synchronization: Building partnerships to ensure the IT strategy is a shared strategy
4) ORGANIZE - Orchestrate a high-performing IT department: Building a high-performance team to deliver cost-effective solutions
5) DELIVER - Provide cost-effective and timely services: Timely delivery and operational execution are critical

6) MEASURE - Know where you stand and why: The tracking and communication of value added results

Waller, Hellenbeck, & Rubenstrunk (2010) state that focusing on the soft skills, leadership and people skills, is what will determine the success or failure of the CIO. They separated a CIO's typical responsibilities into two roles: 1) the management side, and 2) the people side. The management side includes such skills as planning and budgeting, demand management, and operations. The people side includes such skills as vision, inspiring change, and developing relationships.

Technical skills are not enough to make a CIO successful; literature states that these skills are not needed at all. In his article, "Skills of an Effective Administrator," *Katz* (1989) provides an explanation as to why technical skills for a senior IT leader may not be needed. Katz outlines that an effective leader needs to develop three basic skills: technical, human, and conceptual. Technical skills are a proficiency in a specific activity such as project management, engineering, or programming. Human or interpersonal skills involve the ability to work with others. Such human skills include self-awareness, emotional intelligence and communication. Conceptual skills require seeing the big picture, the ability to understand how a specific function depends on other groups, as well as supports the entire organization. Conceptual skills include managing relationships and strategic planning (coordinating and integrating all organizational activities). For the purpose of this study, the characteristics identified in the literature (see table 2) have been categorized into Katz' three developable skills framework (see table 3).

Table 3.

CIO Characteristics Categorized by Katz' Framework

Conceptual	Human	Technical
Business knowledge	Collaboration	Delivery of service
Change agent	Communication skills	Education (own)
Leadership	Emotional Intelligence	Financial management
Making tough decisions	Managing relationships	IT knowledge
Managing Resources	inside institution	IT skills/competencies
Strategic planning	Managing relationships	Marketing Skills
Vision / trends	outside institution	Measuring performance
	Personal development	Negotiating skills
	Professional development	Operational management
	(team)	Political savvy
	Reporting structure	Portfolio management
		Project management
		Risk management

The literature is consistent that CIOs success requires new leadership models and competencies, especially as some question the validity of the role. It is important to identify the critical attributes needed by CIOs to be successful in that role, especially in a faith-based school.

Organizational Design

Faith-based colleges and universities often see their mission differently than secular institutions. The differences focus mainly around the development of the whole person—spiritually, academically, emotionally, and socially. Although there is no common mission statement for faith-based institutions, as each institution views its mission a little differently, denominational relationships and church history influenced the formation and purpose of institutions. Schein (1985) noted that founders play a critical role in creating the original organizational culture based on their prior experience and or beliefs and values. Several faith-based institutions had strong ties to a denomination when founded. This is important as denominational affiliation impacts organizational culture and could influence the CIO's role and success in leading that institution.

The literature reveals that the type of organization influences the leader's characteristics and these characteristics will vary depending on the person and organization. As higher education is different than business, organizational design factors that significantly shape higher education leaders style include type of institution (bachelors, masters, doctoral), size of organization, peer or like institutions, and geographical location. The purpose of this section is to reveal the influence organizational design has on leadership. Even though organizational design encompasses people, culture, values, strategy, structure, size, technology, environment, and processes (Daft, 2004; Goold & Campbell,2002), this study will limit the research to culture, values, structure, and technology.

Culture is one critical dimension that forms the organizational design. Deal and Kennedy (1999) share "beliefs and values form the bedrock of a company's cultural identity." The term culture itself has different influences like national culture, organizational culture, and industry culture (Shaw, 1990), and is defined as "shared motives, values, beliefs, identities, and interpretations of meanings of significant events that result from common experiences of members of collectives and are transmitted across age generations" (House, et. al., 2004). The key is that these norms, beliefs and understandings are shared throughout the organization, as culture is both learned and taught. Values, beliefs and identities are strong influences on the way individuals behave and act and are the basis for how an organization views itself. Values represent the pattern of beliefs among individuals, what they stand for and who they are (Deal & Kennedy, 1999). Beliefs are shared convictions about what is important. Organizational culture is both the shared values of individuals and behavior patterns of the organization (Kotter & Heskett, 1992). Culture is a set of values and behaviors that are common in an organization. They tend to adjust, although slowly, to change around them. "Culture represents an

interdependent set of values and ways of behaving that are common in a community and that tend to perpetuate themselves, sometimes over long period of time" (Kotter & Heskett, 1992). Culture influences strategy by influencing the speed at which strategy can be implemented. The closer the strategy is built around the current culture the quicker the strategy can succeed (Deal & Kennedy, 1999). One method that culture influences structure is the speed of which strategy can be implemented. As stated earlier, higher education tends to be slower in decision making, so the pace at which culture can change also moves slower. Technology has evolved at times faster than strategy anticipated or higher education institutions were prepared to adopt. As technology influences cultural, the culture of the organization and its view of technology, whether operational or strategic, influence the role of the CIO.

Edgar Schein (1985) states that organizational culture is a learned behavior and it is the leader's responsibility to create and manage culture. The learned behavior is formed as solutions are found, and proven to work over time they become an accepted norm for the organization. Organizational culture is living (Deal & Kennedy, 1999) and needs to be treated as a dynamic process (Schein, 1985). Research confirms that culture influences behavior and change can be slow. Often times a key event is a catalyst for behavior change. One such event is the advance in technology. Technological advances have and will continue to serve as one of the drivers of organizational cultural change. Technology has not only revolutionized the workplace, it is also having an impact on organizational culture (Bergquist & Pawlak, 2007; Deal & Kennedy, 1999). Virtual technologies have changed the behavior patterns and methods of collegial interaction. Interactions tended to be informal as conversations took place around the water cooler. Today these informal meetings may not occur, or they may occur online through chat, email, or video

conference. It is critical for the CIO to serve as a change agent in shaping the institutions culture and vision, as culture is shaped in part by technological advances.

The main purpose of an organization's formal structure is to help coordinate activities across organizational lines. Formal structure outlines the responsibilities of working units and the reporting relationships between those units, often times referred to as the organizational chart. The structuring of individual's roles and responsibilities influences organizational patterns, thus culture is impacted by the way organizational activities are structured (Frost, Moore, Louis, Lundberg, & Martin, 1985). Structure and management practices need to be organized in a manner that increases effectiveness. The structure is typically developed around roles and responsibilities, or *who* is responsible for what. As organizations are made up of people who are influenced by organizational culture, the structuring of roles and responsibilities shape the culture. Informal structures are also important as individuals identify with groups of people and or culture. The 2011 EDUCAUSE ECAR report confirms "how variable the CIO role is, and how institutions management practices, organizational design, and culture influence the quality of the IT department" (Arroway, Grochow, Pirani, & Regenstein, 2011). The way CIOs see themselves can inform their success. A strategist in a more technical or operational environment may not be a good fit. The choice of structure and process is made essentially by assessing a priority to the possible dimension of the organization–function, geography, product, market, and process

Galbraith (2002) states "The priority comes from the strategy and particularly from the diversity of the business" (p. 158). Organizational designs are effective when they support the organizations strategy. The reporting structure of the CIO is a contributing factor to how the institution views the IT department. For CIOs that report to the CFO, the technology department

is perceived as having an operational or administrative focus. CIOs that report to the president or executive vice president have a broader view of the institution and are viewed as a strategic partner.

There is much literature about the impact national culture has on leadership style and what leadership attributes work better in certain cultures (House, et. al., 2004). House, et. al. (1999), in their research for the GLOBE project, defined organizational leadership as "the ability of an individual to influence, motivate, and enable others to contribute toward the effectiveness and success of the organizations of which they are members." Fukushige and Spicer (2007) studied leadership preferences in Japan and identified ways that cultural differences influence leadership style. As colleges and universities tend to be more collaborative, participative, and innovative in nature, the CIOs' attributes for being a leader in higher education may be different than the CIOs' attributes for being a leader in another industry. This notion is supported by House, et. al. (1999), who states the values and beliefs held by members are influenced by the behaviors of individuals, groups, and institutions within that culture. One of the attributes identified in the literature that impacts the success of the CIO is the organizational or reporting structure. Stogdill and Shartle (1948) state that organizational culture influences organizational structure. Their research studied the relationship between persons and the organization with a focus on the importance of the location of the executive's position on the organization chart. Leadership is affected by the organizations and culture in which it appears (Bass, 1997). Hunter (2010) states that a successful CIO must focus on one industry, especially as focus shifts to a more organizational emphasis.

Denominational cultural influence. This section focuses on the impact denominational influence has on organizational design. As stated earlier, there is literature on the influence corporate culture and national culture has on leadership style (House, et. al., 1999), and literature that states organizational culture impacts the leadership style of leaders (Bakotic, 2008). The literature is limited on denominational influence on leadership style, however. The discussion of national and organizational culture provides the base for the influence denomination affiliation and institutional culture has on the CIO leadership style at a faith-based college or university. Faith-based institutions were often founded with close ties to denominations; several were founded by very charismatic leaders. Literature reveals that organizational culture and leadership are intertwined (Schein, 1990) and often times the organization reflects the values and traits of the founder. Even a founder's culture came from a previous experience or experiences. Founders with strong denominational ties had previous experiences which were influenced by their denomination or church leadership. The skill set and mindset needed to successfully lead a church or denomination may differ from that skill set and mindset necessary to lead a diverse, comprehensive organization like a college or university.

For instance, the senior leader at a church has direct influence over implementing vision and strategy, while at a university the senior leader casts the vision, although execution of strategy is often shared. Today, faith-based institutions are still influenced by the founding organizational tenets influencing the values, beliefs, and structure at the institution.

As previously noted, personal beliefs, values, and preferences influence a leader's style. Denominational variables especially influence a leader's style. In their article "Women, men and styles of clergy leadership," Zikmund, Lummin, and Chang concluded that denominational expectations (culture) had more influences on style than pastoral position or gender (1998, p.4).

The structure of colleges and organizations, specifically the reporting structure of the CIO, may be influenced by the organizational design of the denomination. One practical example is the depth and importance that faith is integrated in the learning and co-curricular activities.

Conclusion

The role of the CIO at a faith-based institution is impacted by the evolving role of the CIO in general, the advancement in technology, the institution's culture and view on technology, and its strategic use of technology and information. The institutional culture may be influenced by its affiliation with a denomination, which adds another dimension to the impact of the CIO role. The culture and organizational structure of the institution shapes the CIO role. One aspect of culture is the campus view of IT. Does the campus view IT as a utility or a strategic tool? The success also depends on the ability of the CIO to create organizational value and an innovative ecosystem. The challenge is the complexity of the role and the continuous evolving nature of technology. The ambiguous nature or lack of clear parameters around the CIO role, the absence of a clear career path for aspiring CIOs, and the fact that the first career generation of CIOs is about to retire all contribute to the importance and timeliness of this study. The 2009 Higher Education Chief Information Officer Roles and Effectiveness (Brown, 2009) study reports that 55% of current higher education CIOs are 51 years and older and project retirement in the next 10 years. The 2011 EDUCAUSE ECAR research report stated 31% of current higher education CIOs expect to retire in the next six years and 52% expect to retire over the next 10 years (Arroway, et. al., 2011)

The role of the CIO is complex and the career path of becoming a CIO is unclear to date, especially when compared to the relatively clear, defined path for achieving qualifications for other C-level positions. It is necessary to determine the critical attributes needed to be a

successful CIO in order for CIOs to define their role and become effective leaders. The purpose of this study is to determine which attributes an effective CIO at a faith-based college or university needs, and to determine if denominational affiliation influences these necessary attributes.

Chapter 3: Research Methodology

The purpose of this descriptive quantitative study was to determine which characteristics an effective CIO needs at a faith-based college or university, to evaluate the impact organizational design has on the CIO role and these critical characteristics, and to determine if denominational affiliation influences these necessary attributes.

This chapter presents the research design and data analysis for the research on the characteristics of CIO at faith-based institutions. A discussion of the background of this study and a restatement of the problem, purpose and research questions is followed by information about the research and design, sources of data, data collection strategies and instrument, and human subject considerations.

Background

The role and responsibilities of the CIO over the past decade have expanded as the dynamics of the business environment have drastically changed. As mentioned in Chapter 1, the CIO role dates back to the early 1980's, and was first used in print by William S. Synnott and William H. Gruber (1981). Almost 30 years after the introduction of this first use and description of the title, the struggle continues for CIOs to balance successfully their two primary roles of technologist (operations) and business executive (strategy). As technology continues to evolve, the role of the chief information officer must also evolve, moving the CIO from a position of control to a person of influence.

Higher education has seen shifts in the use of information technology, as its use has become critical to the operations of higher education (Hawkins & Marcum, 2002). The unique culture of higher education provides different leadership challenges for CIOs. The collaborative spirit, consensus-driven, and open nature of higher education can, among other items, slow

decision-making. The CIO role is not only about technology; it is also about the ability of a campus-situated academic community to achieve its goals and objectives through technology by working with peers, collaborating, and developing a shared IT vision.

Technology transforms the way organizations function and may be the largest single influence on organizational structure. Advances in technology such as the internet, personal computers, mobile technology, social media, and video conferencing have shrunk the world in which we live and added a level of complexity which is putting new demands on leaders (Wieand, et. al., 2008). The literature reveals that the type of organization the leader represents influences leaders' characteristics. In addition the leader's characteristics will vary depending on the person and the characteristics of the organization (i.e. organizational structure (reporting structure), emphasis placed on technology, budget dedication to technology). Literature also reveals various examples of characteristics desirable for CIOs to possess in in order to be successful. Other than themes of communication (including listening), setting strategy and vision, and forming partnerships, no specific characteristics were revealed for success (Beatty, Arnett, & Liu, 2005; Brown, 2009; Fleit, 1988; Kitzis, 2003; Remenyi, Grant, & Pather, 2005; Synnot, 1987).

Just as Higher Education is known to have its own culture, many would argue that faith-based organizations are even more unique. This descriptive study explores the critical characteristics for success of CIOs within the context of faith-based higher educational institutions, and the impact of organizational design on these critical characteristics.

Restatement of the Problem

Impacting the role of the CIO at a faith-based institution is the evolving role of the CIO, advances in technology, higher education and institutional culture, views on technology, the

strategic use of technology and information, and the faith values of the school. Another dimension that might impact the CIO role is the denominational affiliation influence on institutional culture. Determining which characteristics are critical to be an effective CIO at a faith-based college or university, and determining if denominational affiliation influences the leader's characteristics are the prevailing need. Recent studies (Allison, 2010; Brown, 2009) compound the need by indicating that the first generation of CIOs plan to retire within the next 10 years. This is significant as the literature reveals that the role of the CIO is both complex and lacking clarity with regards to its career path, thus it is questionable how leaders will emerge to replace these CIO retirees. CIOs need new skills to succeed in their evolving role. The literature revealed a divergent viewpoint on skills needed with no specific set of characteristics needed for a CIO to be successful. Kitzis (2003) and Peppard (2010) suggest four common attributes, however -- communication (including listening), setting strategy, collaboration and delivery of service.

Restatement of the Purpose of the Study

The purpose of this study was to determine which characteristics an effective CIO at a faith-based college or university needs, to evaluate the impact organizational design had on the CIO role and these critical characteristics, and to determine if denominational affiliation influenced these necessary attributes. This descriptive study focused on the leadership characteristics of the senior IT leaders from the Council for Christian Colleges and Universities (CCCU, n.d.).

Research Objectives and Research Questions

With the need to identify and clarify a pathway for current and aspiring CIOs within the CCCU, by determining the critical characteristics needed for success and discovering any institutional factors that impact these characteristics, this study aimed to address the following research objectives:

- Determine the critical characteristics of CIOs at CCCU institutions
- Determine how denominational affiliations influence reporting structure at CCCU institutions
- Determine if organizational demographics impact CIO characteristics at CCCU institutions

Specifically, this study sought to address the following research questions:

1. What is the current state of the CIO in regards to reporting structure and title of the CIO?
2. What are the current self-reported characteristics of CIOs at CCCU institutions?
3. How does size and reporting structure of the institution impact CCCU CIO characteristics?
4. How do organizational demographics impact the state of the CIO in regards to reporting structure and title of the CIO?

Research Design

The research approach was descriptive quantitative in nature. Quantitative research, as described by Creswell (2009) is “a means for testing objective theories by examining the

relationship between variables" (p 4). Descriptive research describes the phenomena as it exists (Vogt, 1993). This study utilized a descriptive design method to analyze the various data collected. The research design consisted of a survey to determine current state and characteristics of the CIO. According to Alreck and Settle (2004), a survey is designed to capture information about attitudes, decisions, needs, and opinions about a population. The design was appropriate as the participants were asked to identify characteristics needed to be an effective IT leader. The results allowed the researcher to discover and report the characteristics needed for a CIO at a Council for Christian Colleges and Universities (CCU's) institution, and to report any influence organization demographics had on these characteristics. Providing clarity for current and aspiring CIOs within the CCCU requires identifying the needed future characteristics and determining which organization demographics influence these future characteristic.

Sources of Data

For the purpose of this study the primary source of data was the senior IT leader at each Council for Christian Colleges and Universities member institution located in the United States. According to the *Charting the Terrain of Christian Higher Education in America: A Profile of the Member Institutions of the Council for Christian Colleges &Universities,* there are 118 institutions, representing 28 denominations with 80% of coalition member institutions being affiliated with a denomination (CCCU research publication, 2012). A member institution of the CCCU has the following key characteristics (CCCU.org, n.d.):

- Strong commitment to Christ-centered higher education
- Located in the United States or Canada
- Full regional accreditation (U.S. campuses)
- Primarily four-year comprehensive colleges and universities

- Broad curricula rooted in the arts and sciences
- Christians hired for all full-time faculty and administrative positions
- Sound finances

The target population was the senior IT leader at these 118 U.S. member institutions. In this study, the researcher sought to determine the views of these IT leaders concerning the characteristics for effective service in CIO positions at CCCU institutions.

Data Collection

Gathering the data for the study utilized the online survey tool, Stellar Survey. Stellar Survey allowed the researcher the ability to design a survey, send a link of the survey, and collect and download data for analysis. A personalized email was sent to each of the participants explaining the purpose for the survey, describing the research and parameters (confidentiality and risk), providing the link to the survey, and asking them to participate in the study (see Appendix A). The participants who had not opened the initial email received a reminder email one week after the initial email. The participant was the senior person responsible for information technology at their respective institution.

The survey was conducted in October 2014, after the start of the fall semester, to avoid potential time conflicts. The survey was available for two weeks. Achieving the minimum number of participants needed permitted the closing of the survey after a two week period. The research required a survey response from12 participants, based on descriptive research requiring a sample of 10 percent of the total population; however, the goal was twenty or greater. Anticipated interest in the topic and the study results by the target population resulted in an expected acceptable response rate (Groves, Presser, & Dipko, 2004). The researcher is active

among the CCCU IT membership and maintains a professional relationship with IT leaders within the CCCU. Failing to reach a minimum of 12 participants from the118 targeted within this population was an unanticipated obstacle to the success of this study. The survey tool website allowed the data to be collected on their site. After the survey closed, downloading the data for analysis occurred.

Instrument

The online survey method this study used was economical, provided a more timely data collection method than mail surveys, and allowed the use of a larger population (Alreck & Settle, 2004). A self-administered survey was selected for several benefits including reduced cost, shortened length reducing participants' fatigue, and a larger sample size. In addition, a self-administered survey allows the target population to receive the survey concurrently, and increase willingness of respondents to answer sensitive questions (Bourque & Fielder, 1995; Bryman & Bell, 2007).

The survey instrument was a two-part questionnaire designed to measure the characteristics of a CIO and their institutions. The first part was designed to gather current status about the CIO and institutional demographics. The second part asked participants to provide their assessment concerning characteristics needed by current and future CIO's.

The data collection instrument was a survey consisting of closed responses and ranked items. As a survey did not exist, one was developed (see Appendix B). Utilizing questions from existing validated surveys with similar research focus, as appropriate, assisted in validating the survey. The survey consisted of thirteen questions separated into two parts. The organizational demographic portion of the survey (Part I) contained vertical formatted closed questions identifying gender, age, job title and role, reporting structure, membership on president's

council, student body full time equivalent (FTE), and denominational affiliation of institution. The characteristics portion of the survey (Part II) provided an ordinal scale in order to assess the level of agreement to the items. The characteristics portion of the survey used the characteristics revealed through the literature review to show their value and importance with relation to the future of CIOs, as well as seven characteristics identified during the survey validation process.

The characteristics section consisted of four questions asking the participant to provide their perception on the characteristics. The characteristics consisted of attributes appearing in literature and that the expert group identified. The first two questions in this section asked the participants for their assessment of the characteristic for their current position and needed in the future. For the next question participants ranked the top six most needed future characteristics. The final question participants identified any critical characteristics that were missing. The participants rated the characteristics needed using a five-point scale. The scale allowed the participants to select a level of importance for each characteristic. The scale ranged from very low to very high or strongly disagree to strongly agree. The participant was asked to use numbers 1 to 5 to indicate their level of agreement with each characteristic. A low score indicates the participant was in agreement with the statement. The first question asked the participants to indicate the level of importance for each characteristic in their current position.

The levels of importance scale used for the survey was as follows: 1, *very high*; 2, *high*; 3, *medium*; 4, *low* and 5, *very low*. The second question asked the participants to indicate their level of agreement for each characteristic for success over the next 20 years. The levels of agreement scale used for the survey was as follows: 1, s*trongly agree*; 2, *agree*; 3, *neutral*; 4, *disagree*; and 5, s*trongly disagree*. The participants then ranked these same characteristics for

the six most important characteristics needed for success over the next 20 years. The last question, asking for any missing characteristics, was an open ended question.

Validation of the Survey Instrument

A group of experts reviewed the instrument determining if the questions on the survey contained the data needed to answer the research questions. The experts consisted of four members, all who are qualified to review surveys and all who work in higher education. Inviting participation of the expert group transpired via email. The email included information about the study, the purpose of the group, and a link to the survey. The email also included Chapter 1of this study and an executive summary of the study as an attachment. The experts responded with any concerns or comments, in order to adjust the survey based on their feedback and recommendations. All experts agreed the survey would obtain the necessary data to answer the research questions. The experts recommended changing the size of institution question to a required question; broadening the range of age from 5 years to 10 years, resulting in the survey containing 7 age range choices rather than 9 choices; grammatical modifications to wording of three questions; and capitalization issues of the characteristics. The experts also mentioned three additional characteristics -- influencing technology direction (IT evangelist), access to the president, and policy maker -- which the final survey contained.

After making the experts' recommended changes to the instrument, the researcher executed a pilot study consisting of a small group of senior IT leaders who were not part of the usability sample group. The pilot group consisted of twenty current or former CIOs. The pilot group received an email explaining the study, asking them to participate and provide feedback about clarity of questions. The link to the survey was included in the email. The pilot group identified confusion in the numbering of the survey, as the first question began with the number

two. The final survey contained the modified numbering. The pilot group also identified four additional characteristics -- portfolio management, risk management, marketing skills, and emotional intelligence -- which the final survey contained.

Validity and Reliability

The study utilized a newly created instrument. This fact introduced validity and reliability issues. A pilot study was performed to reduce some usability concerns. Reliability is concerned with replicability of results. For instance, does the same question asked to the same respondent result in the same answer if administered at different times. This suggests high reliability. For new surveys, it is important to test for reliability (Litwin, 1995). The use of a pilot group to test the survey's scale reliability helps improve the reliability of the survey instrument questions. Validity refers to how well the survey measures what it sets out to measure (Litwin, 1995). According to Bryman and Bell (2007), validity is about ensuring integrity. For example, does the measurement activity actually measure what it states it will? For this study, the developed survey instrument established content validity through the use of experts. Content validity ensures the instrument measures the content being studied accurately. A panel of experts was used to assess the content validity of the survey instrument and provide suggestions for changes with respect to face validity. A pilot survey was conducted for usability testing to find errors in the surveys form and presentation. Conducting the pilot survey ensured that the questions were easily understandable. The pilot group consisted of current or former senior IT leaders (CIO's) who were not in the target population. The individuals selected were familiar with online surveys and experienced in the CIO role.

Internal Validity. Internal validity threats can include changes to the instrument during the study, allowing control groups to converse, and causing participants to change their views during the study (Creswell, 2009). Validity threats were minimized by the following means. The Stellar Survey tool, like other similar products, mitigates the risk of changing the tool during the study. Once the study is open to participants, the software does not allow for modifications without closing the instrument to the participants and inviting the possibility of lost data. The characteristics questions could not be changed unless the data was deleted. To ensure the participants received the survey around the same time, an email was distributed containing the survey link (Bourque & Fielder, 1995).

External Validity. External validity refers to how far the results from the study can generalize to other populations or contexts (Bryman & Bell, 2007). Creswell (2009) explains that the researcher must not make incorrect inferences to additional groups or settings. To reduce external validity concerns, the entire population received an email containing the link to the survey. The population was limited to the CIOs in the CCCU. The researcher ensured that the purpose of this study was to describe the current state of the CIOs in the CCCU, define the characteristics needed for their success and any impact organizational design has on these characteristics, and provide an analysis of data collected over one two-week time frame.

Data Analysis

Creswell (2009) defines descriptive analysis as "describing the results through mean, standard deviation, and range of scores" (page 228). Descriptive statistics is the procedure of summarizing and organizing data for describing quantitative information (Vogt, 1993). The

survey asked participants questions that measure the characteristics of a CIO and attributes of their institutions.

Downloading the data from the online survey tool, Stellar Survey, ensued after the survey closed. The researcher then imported the data into NCSS 9.0 statistical software for analysis. The presentation of the results, after applying descriptive analysis, utilized the use of central tendencies with regards to current state of the CIO and current CIO characteristics. This study used figures and frequency tables, when appropriate, to display key descriptive findings. The variables in Part I of the survey, organizational demographics, were attributes. The variable for the description of current and future needed characteristics of leaders within the CCCU in Part II were also attributes. The ranking of the key characteristics needed for success in the future in Part II were numeric. The relationship between the size of school and CIO characteristics, as well as CIO reporting structure and CIO characteristics, was determined by using Chi-square statistical analysis. The relationship between the CIOs reporting structure and the institution's denominational affiliation was determined by utilizing Chi-square analysis. The criterion for decision making, utilizing the Chi-square test, was a level of significance of 0.05. This study utilized cross tabulation tables to report Chi-square results. The relationship between organizational design and ranking of CIO characteristics was determined by applying analysis of variance (ANOVA). This study employed tables to display ANOVA results. The criterion for decision making, utilizing analysis of variance, was a level of significance of 0.05.

Human Subjects Considerations

There was minimal risk to the participants of this study as the data being collected poses minimal risk to their institution or to the participants personally. The respondents were not embarrassed or threatened to answer the survey questions as they are not sensitive in nature.

According to Alreck and Settle (2004), the respondent's privacy and anonymity should be honored. Responses were anonymous and the survey was strictly voluntary. The responses were confidential and used only for the purpose of this study. To minimize any personal risk, all responses were summarized removing the ability to identify specific institutions or persons. There were no known physical risks to the individuals who participated.

The proposed study was submitted to Pepperdine University's Graduate Professional Institutional Review Board (IRB) in July 2015 for approval as exempt. The explanation provided to IRB for exemption follows. The research activity involved survey research with an adult population that is not a protected group. The survey did not ask for information that can directly identify the participant nor were any identifiers used to directly link participants to their data. The study presented minimal risk to the participants and disclosure of data outside of the purpose of this study did not place the participants at risk of criminal/civil liability. Participation in this study did not present risk to participant's financial standing, employability or reputation. This study was exempt based on the federal regulations section 45 CFR 46.101(b)(2).

Submission of an application to IRB to waive participants sending an official consent form back to the investigator also occurred. Clicking on the survey link in the email, agreeing to consent on the first screen of online survey, and submitting the survey served as the participants' official consent. Requiring a formal consent form to be returned when using email as the main communication method could delay the collection of data. Advantage of online surveys include that the participants received the survey within the same time period and online surveys provide a convenient method for respondents to respond. Returning a formal consent form complicated the advantages of online surveys.

The IRB determined that this study met the requirements for exemption in July, 2014. At the same time, approval of the application to waive documentation of informed consent also transpired.

Chapter 4: Data Collected and Analysis

The purpose of this descriptive quantitative study was to determine which characteristics an effective CIO at a faith-based college or university needs, to evaluate the impact organizational design has on both the CIO role and these critical characteristics, and to determine if denominational affiliation influences these characteristics. The population sample represented senior IT leaders in the United States from member schools of the Council for Christian Colleges and Universities (CCCU, n.d.).

Chapters 1-3 described the purpose of study, review of literature, and the research methodology. Chapter 1 provided an overview and background of the CIO role including the problem statement and significance of the study. The chapter 2 review outlined current literature on the role of the CIO, attributes of the CIO, and the impact organizational design has on leadership. Chapter 3 outlined the research design, sources of data, data collection and analysis process, and instrument information, including validity and reliability.

Chapter 4 describes the data collected and analysis performed related to the following four research questions:

Research Question 1: What is the current state of the CIO in regards to reporting structure and title of the CIO?

Research Question 2: What are the current self-reported characteristics of CIOs at CCCU institutions?

Research Question 3: How does size and reporting structure of the institution impact CCCU CIO characteristics?

Research Question 4: How do organizational demographics impact the state of the CIO in regards to reporting structure and title of the CIO?

Data Collection

The data for this study originated from a self-administered online survey. The survey instrument was a two-part questionnaire designed to measure the characteristics of a CIO and their institutions. The results this chapter reports come from the responses of the survey questionnaire intended to gather the CIO's view on successful characteristics and institutional organizational design information. A total of 117 surveys were sent to the senior-most person responsible for information technology (CIO) at their CCCU institution via a personal email. Twenty-seven of the 117 leaders participated in the study: a response rate of 23%.

Descriptive analysis was utilized to present the results through the use of central tendencies with regards to the current state and characteristics of the CIO. This study used figures and frequency tables, when appropriate, to display findings. The relationship between organizational design and CIO characteristics was determined by using Chi-Square statistical analysis. Chi-square utilization occurs when both variables are attributes. This study utilized cross tabulation tables to report results. The relationship between organizational design and ranking of characteristics was determined by using analysis of variance (ANOVA). ANOVA analysis occurs when one variable is numeric and one variable is an attribute. This study utilized tables to display results.

Overview of CIOs Descriptive Data

For the purpose of this study, Figures 1and 2 represent the collected demographic data of the respondents. The majority of respondents, 24 out of 27 or 89%, were male; 3 of the 27 or 11%, were female (see figure 1).

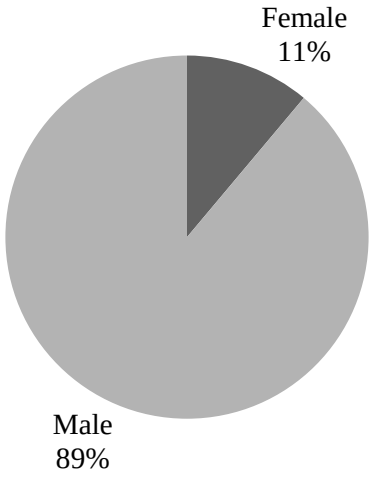

Figure 1. Gender demographics of respondents

In Figure 2, the highest number of the respondents, 10 out of 27 or 37%, identified their age as between 50-59 years. Eight out of 27 or 30% identified their age as between 30-39 years; 6 out of 27 or 22%, identified their age as between 30-39 years; and 3 out of 27 or 11% identified their age as 60 years or older. None of the respondents identified their age being under 30 years.

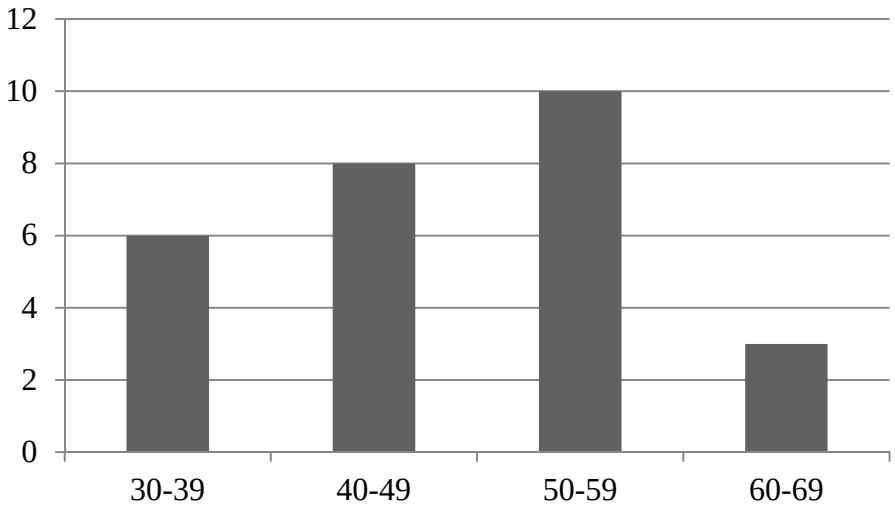

Figure 2. Age demographics of respondents

Overview of CIOs Institutional Descriptive Data

For the purpose of this study, Figures 3 and 4 represent the collected demographic data of the respondent's institution. In Figure 3, the plurality of the CIOs who responded, 13 out of 27 or 48%, served at institutions with less than 2,000 students. Ten out of 27 or 37% CIOs served at institutions with 2,000-3,999 students; 3 out of 27 or 11% CIOs served at institutions with 4,000-5,999 students; and 1 out of 27 or 4% CIOs served at institutions with over 10,000 students. Figure 3 illustrates that 85% of the CIOs served at institutions with less than 4,000 students.

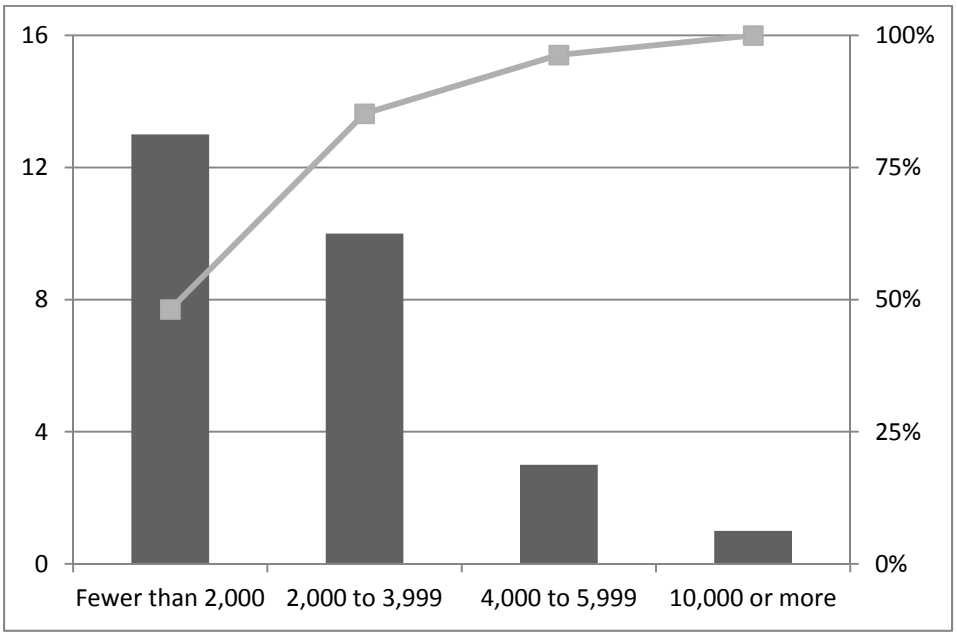

Figure 3. FTE demographics of respondents' institution

Figure 4 show that 9 out of 27 or 33%, CIOs identified that their institutions denominational affiliation was non-denominational. Six out of 27 or 22% identified as Baptist; and the other 12 out of 27or 44% identified as various.

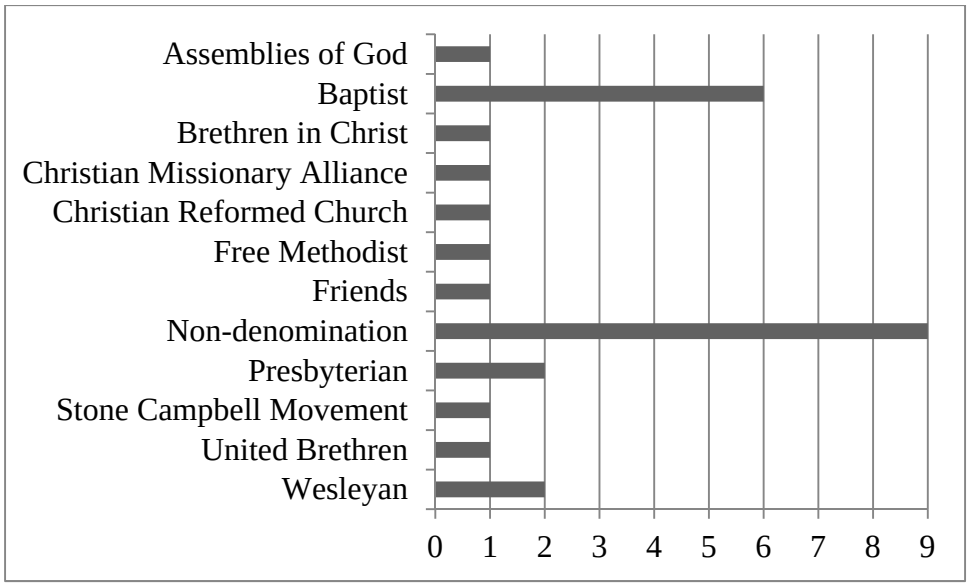

Figure 4. Denomination demographics of respondents' institution

Research Questions

Research Question 1. What is the current state of the CIO in regards to reporting structure and title of the CIO?

Based on the participants' responses, Figures 5-8 show the current reporting structure, membership of the leadership cabinet, and title of the CIO. In Figure 5, the largest number of the CIOs, 12 out of 27, reported to the vice president of finance / chief financial officer. Six out of 27 CIOs reported to the president; 5 out of 27 CIOs reported to the executive vice-president/ chief operations officer; and the remaining 4 out of 27 CIOs reported to other positions.

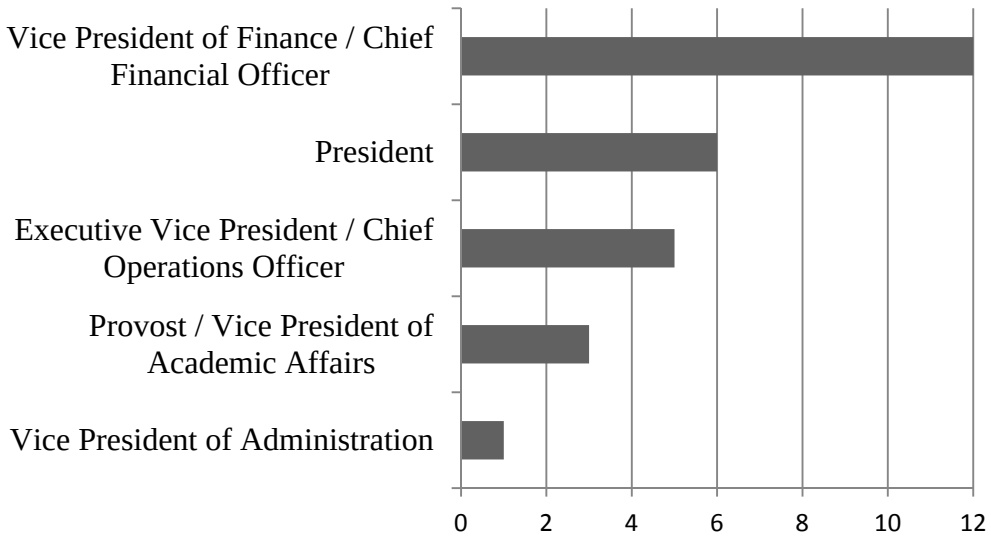

Figure 5. Reporting structure demographics of CIOs

Figure 6 illustrates that 14 out of 27, or approximately 52%, of the participants were a member of the president's cabinet or council.

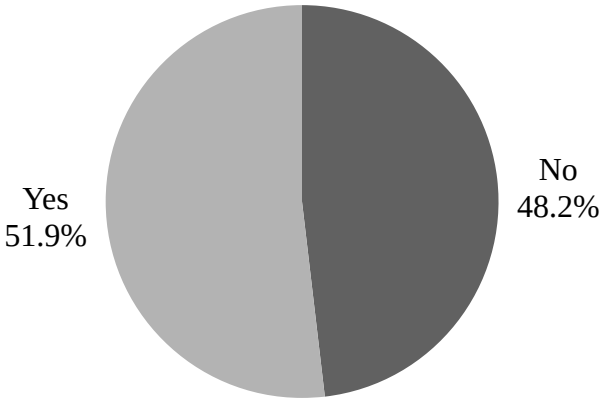

Figure 6. President's Council membership demographics of participants

In Figure 7, nine out of 27 or 33%, of respondents identified that their title was director. Five out of 27 or 19% respondents identified their title was vice president/ provost; 4 out of 27 or 14%

respondents identified their title was associate vice president / provost; and 3 out of 27 or 11% respondents identified their title was other. Of the 27 respondents, 6 or 22% identified their title was CIO with no position (vice president or director) as part of their title.

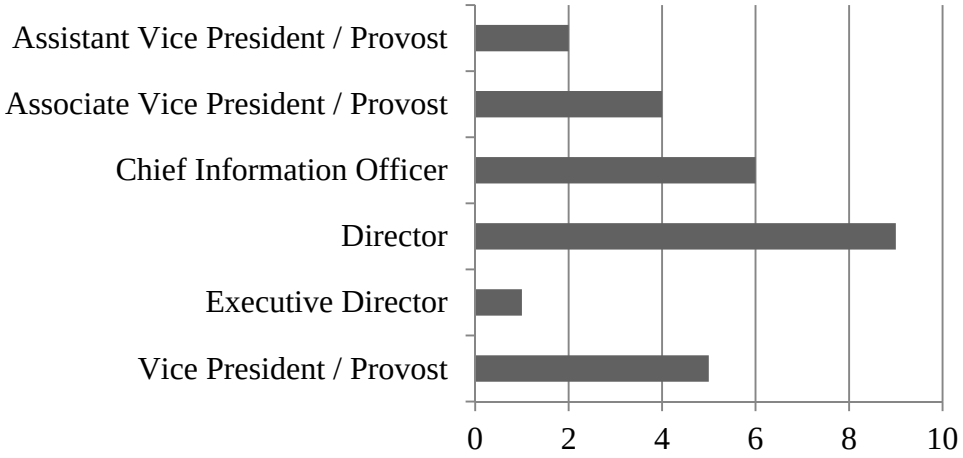

Figure 7. Position title demographics of respondents

Twenty-six out of 27 or 96% of the participants responded that they function in the CIO role at their institution; Figure 8 shows 12 out of 27 or 44% of the respondent have CIO as part of their title, however.

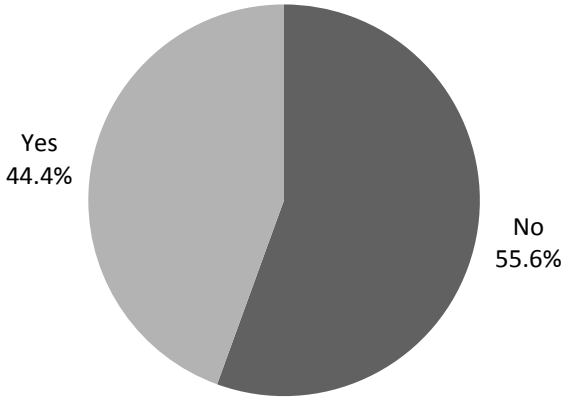

Figure 8. CIO title demographics of respondents

A cross tabulation of the data for position title and CIO title showed that a disproportionally larger number of directors do not have the CIO title. The probability level was 0.01. The alpha level was 0.05

Research Question 2. What are the current self-reported characteristics of CIOs at CCCU institutions?

Survey question ten requested that the participants identify which characteristics a successful CIOs needs in their current position (see table 4). The top current characteristic identified was strategic planning, with 66.7% of the CIOs responding very high. Closely behind was leadership with 63%. Communication skills and delivery of service were tied with 59.3% of the CIOs rating these characteristics very high. Completing the top five was vision and trends with 55.6%. The last characteristic above 50% was managing relationships within the institution, with 51.9% of CIOs rating this characteristic very high.

Table 4.

CIOs Current Characteristics in Descending Order by Percentage

		Very High	
	N	Number	Percentage
Strategic planning	27	18	66.7%
Leadership	27	17	63.0%
Communication skills	27	16	59.3%
Delivery of service	27	16	59.3%
Vision /Trends	27	15	55.6%
Managing relationships within your institution	27	14	51.9%
Change agent	27	13	48.1%
Collaboration	27	13	48.1%
Emotional intelligence	26	12	46.2%
Managing resources	27	12	44.4%
Making tough decisions	26	11	42.3%
Influence technology direction (IT evangelist)	27	11	40.7%
Access to president	26	9	34.6%
Business knowledge / processes and operations	26	9	34.6%
Policy maker	27	8	29.6%
Political savvy	27	8	29.6%
Professional development (team)	27	8	29.6%
IT Knowledge	25	6	24.0%
Project management	27	6	22.2%
Negotiation skills	26	5	19.2%
Reporting structure	26	5	19.2%
Financial management	26	5	19.2%
IT skills competencies	27	5	18.5%
Risk management	27	5	18.5%
Personal development	27	4	14.8%
Operational management	27	4	14.8%
Measuring performance / analytics	26	3	11.5%
Portfolio management	26	2	7.7%
Education (own)	27	2	7.4%
Managing relationships outside your institution	26	1	3.8%
Marketing skills	27	1	3.7%

The lowest rated characteristic was marketing skills; with 3.7% of CIOs rated it very high and 29.6% of the CIOs rated it low. Reporting structure and access to the President were tied with 15.4% of the CIOs rating these characteristics as low. There were no characteristics rated very low.

Survey question eleven asked that the participants identify which characteristics a successful CIO needs in the future. Table 5 displays the future need characteristics ranking alongside the current characteristics ranking. The top future needed characteristic identified was leadership, with 77.8% of CIOs strongly agreeing. Strategic planning was second, with 74.1% of the CIOs strongly agreeing. Vision and communication skills were tied with 66.7% of the CIOs strongly agreeing. Completing the top five characteristics was managing relationships within the institution, with 65.4% of CIOs strongly agreeing. Influence technology direction (IT evangelist), was another characteristic above 50%, with 57.7% strongly agreeing. Tied at 51.9% strongly agreeing was making tough decisions, delivery of service, and change agent.

Managing relationships outside the institutions and marketing skills were tied as the characteristics with the least participants strongly agreeing (3.7%). 11.5% of the CIOs disagreed that marketing skills was a need future characteristic. There were no characteristics that CIOs strongly disagreed were not needed in the future.

Survey question twelve asked the CIOs to rank the six most critical CIO characteristics needed over the next twenty years (see table 6). The top ranked characteristic identified by the CIOs was strategic planning, with a composite score of 58, followed by communication skills with a composite score of 53.

Table 5.

Comparison of Future and Current Characteristics in Descending Order by Future Percent

	Future Percent	Future Rank	Current Rank	Current Percent
Leadership	77.8%	1	2	63.00%
Strategic planning	74.1%	2	1	66.70%
Vision / Trends	66.7%	3	5	55.60%
Communication skills	66.7%	4	3	59.30%
Managing relationships within your institution	65.4%	5	6	51.90%
Influence technology direction (IT evangelist)	57.7%	6	12	40.70%
Making tough decisions	51.9%	7	11	42.30%
Delivery of service	51.9%	8	4	59.30%
Change agent	51.9%	9	7	48.10%
Business knowledge / processes and operations	44.4%	10	14	34.60%
Collaboration	44.4%	11	8	48.10%
Risk management	44.4%	12	24	18.50%
Managing resources	40.7%	13	10	44.40%
Emotional intelligence	40.7%	14	9	46.20%
Political savvy	36.0%	15	16	29.60%
Access to president	34.6%	16	13	34.60%
Professional development (team)	33.3%	17	17	29.60%
Financial management	33.3%	18	22	19.20%
Negotiation skills	29.6%	19	20	19.20%
Policy maker	25.9%	20	15	29.60%
Managing relationships outside your institution	25.9%	21	30	3.80%
IT Knowledge	25.9%	22	18	24.00%
Measuring performance / analytics	25.9%	23	27	11.50%
Project management	25.9%	24	19	22.20%
Portfolio management	25.9%	25	28	7.70%
Operational management	25.9%	26	26	14.80%
Reporting structure	18.5%	27	21	19.20%
Personal development	18.5%	28	25	14.80%
Education own	14.8%	29	29	7.40%
IT skills /competencies	11.5%	30	23	18.50%
Marketing skills	11.1%	31	31	3.70%

Table 6.

CIOs Top Six Characteristics in Descending Order by Composite Score

		Count of Rank						Composite	
	N	1	2	3	4	5	6	Score	Mean
Strategic planning	27	6	5	0	5	2	2	58	2.15
Communication skills	26	2	3	0	3	3	3	53	2.04
Vision / Trends	26	7	4	5	0	3	0	45	1.73
Managing relationships within your institution	26	1	2	2	4	1	2	44	1.69
Managing resources	26	2	1	0	1	3	2	35	1.35
Influence technology direction (IT evangelist)	25	1	2	2	3	1	1	34	1.36
Leadership	26	4	2	5	0	0	1	29	1.12
Change agent	26	0	2	1	1	1	2	28	1.08
Risk management	25	0	1	0	2	0	3	28	1.12
Political savvy	25	1	1	0	1	2	1	23	0.92
Business knowledge processes and operations	26	1	2	1	1	2	0	22	0.85
Measuring performance / analytics	26	0	2	1	1	1	1	22	0.85
IT Knowledge	26	2	0	1	0	2	1	21	0.81
Emotional intelligence	24	2	2	1	1	1	0	18	0.75
Collaboration	25	0	1	2	1	0	1	18	0.72
Project management	25	0	1	0	1	1	1	17	0.68
Financial management	26	0	1	0	1	1	1	17	0.65
Making tough decisions	25	1	3	1	0	1	0	15	0.60
Access to president	25	2	0	2	0	0	1	14	0.56
Operational management	25	0	1	0	0	1	1	13	0.65
Delivery of service	25	1	2	0	0	0	1	11	0.44
Professional development (team)	25	0	2	0	0	0	1	10	0.40
Negotiation skills	25	0	1	1	1	0	0	9	0.36

(continued)

		Count of Rank						Composite	
	N	1	2	3	4	5	6	Score	Mean
Reporting structure	24	0	1	0	0	0	1	8	0.33
Personal development	25	0	1	0	0	0	1	8	0.32
Managing relationships outside your institution	25	0	1	0	0	1	0	7	0.28
Policy maker	25	0	1	1	0	0	0	5	0.20
IT skills / competencies	25	0	0	1	0	0	0	3	0.12
Marketing skills	25	0	1	0	0	0	0	2	0.08
Education (own)	26	0	1	0	0	0	0	2	0.08
Portfolio management	25	0	1	0	0	0	0	2	0.52

Next, with a composite score of 45, was vision and trends, followed by managing relationships within the institution, with a composite score of 44. Completing the top six characteristics were managing resources, with a composite score of 35, followed by influence technology direction (IT evangelist), with a composite score of 34.

The ranking of the six most critical CIO characteristics needed over the next twenty years does not change when reported by the mean, except the reversal of managing resources and influence technology direction when comparing the composite score. Table 7 shows the six most critical CIO characteristics needed over the next twenty years identified by CIOs as not ranked in the top six. The six characteristics identified are the same as above, although in a different order, with leadership listed instead of managing resources. Tied at number 7 are managing resources and emotional intelligence, with 17 CIOs identifying these characteristics as not in the top 6.

Table 7.

CIO Characteristics Not in Top Six Ranking in Ascending Order

Characteristic	Not in Top 6
Strategic planning	7
Vision / Trends	7
Communication skills	12
Managing relationships within your institution	14
Leadership	14
Influence technology direction (IT evangelist)	15

Survey question 13 offered CIOs the opportunity to identify any missing future needed characteristics from table 4. CIOs identified the following characteristics: ethics and morality, faith in relationship to work environment, learning technologies, flexibility, and speaking / presentation skills.

Research Question 3. How does size and reporting structure of the institution impact CCCU CIO characteristics?

Cross tabulation of the data for size and reporting structure compared to current and future characteristics showed that both size and reporting structure influenced certain current and future characteristics. Table 8 is the cross tabulation for size and current characteristics. A disproportionately larger number of CIOs at schools with fewer than 2,000 students identified influencing technology direction (IT evangelist) as low, medium or high importance. A larger number of CIOs at schools with 2,000 or more students than expected identified influencing technology direction (IT evangelist) as very high importance.

A disproportionately larger number of CIOs at schools with fewer than 2,000 students identified being a change agent as very high importance. A larger number than expected of CIOs at schools with 2,000 or more students identified being a change agent as low, medium or high importance.

Table 8.

Cross Tabulation for Size and Current Characteristics (n=27)

		Size of Institution (FTE)		
Scale		Fewer than 2,000	2,000 or more	Total
Influence Technology Direction (IT Evangelist)				
Low, Medium, High	Count	11	5	16
	Expected Count	7.7	8.3	16
Very High	Count	2	9	11
	Expected Count	5.3	5.7	11
Change Agent				
Low, Medium, High	Count	4	10	14
	Expected Count	7.3	6.7	14
Very High	Count	10	3	13
	Expected Count	6.7	6.3	13

The next cross tabulation table is for size and future characteristics. An asymmetrically smaller number of CIOs at schools with 2,000 or more students agreed that managing relationships outside the institution is a needed future characteristic. Similarly, a larger number of CIOs at schools with less than 2,000 students agreed more that managing relationships outside the institution is a needed future characteristic than expected (see table 9).

Table 9.

Cross Tabulation for Size and Future Characteristics (n=27)

		Size of Institution (FTE)		
Scale		Less than 2,000	2,000 or more	Total
Managing Relationships Outside the Institution				
Agree	Count	10	4	14
	Expected Count	6.7	7.3	14
Neutral	Count	1	5	6
	Expected Count	2.9	3.1	6
Strongly Agree	Count	2	5	7
	Expected Count	3.4	3.6	7

Table 10 is the cross tabulation table for reporting structure and current characteristics. A disproportionately larger number of CIOs reporting to the president identified access to the president as high or very high importance. An extremely larger number of CIOs reporting to the vice president of finance / chief financial officer identified access to the president as medium or low importance.

Table 10.

Cross Tabulation for Reporting Structure and Current Characteristics (n=26)

Scale	Reports To				
	President	Executive VP / COO	VP, Finance / CFO	Other	Total
Access to the President					
Medium, Low					
Count	0	3	7	1	11
Expected Count	2.5	2.1	4.7	1.7	11
Very High, High					
Count	6	2	4	3	15
Expected Count	3.5	2.9	6.3	2.3	15

The next cross tabulation table is for reporting structure and future characteristics. A disproportionately larger number of CIOs reporting to the executive vice president / chief operation officer disagreed access to the presidents is a need future characteristic. A larger number than expected of CIOs reporting to the president strongly agreed access to the presidents is a need future characteristic. An unevenly larger number of CIOs reporting to the president agreed portfolio management is a needed future characteristic. A larger number than expected of CIOs reporting to the vice president of finance / chief financial officer identified neutral that portfolio management is a needed future characteristic (see table 11).

An analysis of variance was conducted to determine if the size of the institution impacted the ranking of the top six characteristics needed for the future. Table 12 shows that institutions with 10,000 or more students ranked policy making (p-level = 0.00) and managing relationship outside institution (p-level = 0.00) more in the top six needed future characteristics than all the other size groups. The alpha level was 0.05.

Table 11.

Cross Tabulation for Reporting Structure and Future Characteristics (n=26)

Scale		Reports To			
		President	Executive VP / COO	VP, Finance CFO	Other
Access to the President					
Agree	Count	1	1	4	4
	Expected Count	2.3	1.9	4.2	1.5
Disagree	Count	0	2	0	0
	Expected Count	0.5	0.4	0.8	0.3
Neutral	Count	0	2	3	0
	Expected Count	1.2	1	2.1	0.8
Strongly Agree	Count	5	0	4	0
	Expected Count	2.1	1.7	3.8	1.4
Portfolio Management					
Agree	Count	5	3	3	2
	Expected Count	2.9	2.4	5.8	1.9
Disagree	Count	0	0	0	2
	Expected Count	0.4	0.4	0.9	0.3
Neutral	Count	0	0	5	0
	Expected Count	1.1	0.9	2.2	0.7
Strongly Agree	Count	1	2	4	0
	Expected Count	1.6	1.3	3.1	1

Table 12.

Difference between Size of Institution and Characteristics ranking (n=25)

Comparison Groups	Count	Mean	Mean Difference	P-Value	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
Policy Making						
10,000 or more	1	3.00				
- 2,000 to 3,999	9	-8E-16	3.00	0.00	1.77	4.23
- 4,000 to 5,999	3	1E-15	3.00	0.00	1.65	4.35
- Fewer than 1,999	12	0.17	2.83	0.00	1.62	4.048
2,000 to 3,999	9	-8E-16				
- 10,000 or more	1	3.00	-3.00	0.00	-4.23	-1.77
- 4,000 to 5,999	3	1E-15	-2E-15	1.00	-0.78	0.78
- Fewer than 1,999	12	0.17	-0.17	0.80	-0.68	0.35
4,000 to 5,999	3	1E-15				
- 10,000 or more	1	3.00	-3.00	0.00	-4.35	-1.65
- 2,000 to 3,999	9	-8E-16	2E-15	1.00	-0.78	0.78
- Fewer than 1,999	12	0.17	-0.17	0.93	-0.92	0.59
Fewer than 1,999	12	0.17				
- 10,000 or more	1	3.00	-2.83	0.00	-4.05	-1.62
- 2,000 to 3,999	9	-8E-16	0.17	0.80	-0.35	0.68
- 4,000 to 5,999	3	1E-15	0.17	0.93	-0.59	0.92
Managing Relationships Outside Institution						
10,000 or more	1	5.00				
- 2,000 to 3,999	9	-1.3E-15	5.00	0.00	3.770	6.230
- 4,000 to 5,999	3	2.0E-15	5.00	0.00	3.653	6.347
- Fewer than 1,999	12	0.17	4.83	0.00	3.619	6.048
2,000 to 3,999	9	-1.3E-15				
- 10,000 or more	1	5.00	-5.00	0.00	-6.230	-3.770
- 4,000 to 5,999	3	2.0E-15	-3E-15	1.00	-0.778	0.778
- Fewer than 1,999	12	0.17	-0.17	0.80	-0.681	0.348

(continued)

Comparison Groups	Count	Mean	Mean Difference	P-Value	95% Confidence Interval Lower Bound	Upper Bound
4,000 to 5,999	3	2.0E-15				
- 10,000 or more	1	5.00	-5.00	0.00	-6.347	-3.653
- 2,000 to 3,999	9	-1.3E-15	3E-15	1.00	-0.778	0.778
- Fewer than 1,999	12	0.17	-0.17	0.93	-0.920	0.586
Fewer than 1,999	12	0.17				
- 10,000 or more	1	5.00	-4.83	0.00	-6.048	-3.619
- 2,000 to 3,999	9	-1.3E-15	0.17	0.80	-0.348	0.681
- 4,000 to 5,999	3	2.0E-15	0.17	0.93	-0.586	0.920

An analysis of variance was conducted to determine if the reporting structure of CIOs impacted the ranking of the top six characteristics needed for the future. Table 13 shows that the CIO who reported to vice president of administration ranked negotiating skills (p-level = 0.00) more in the top six needed future characteristics than all the other groups.

Table 13.

Difference between Reporting Structure and Characteristics Ranking (n=25)

Comparison Groups	Count	Mean	Mean Diff.	P-Value	95% Confidence Interval Lower Bound	Upper Bound
Negotiation Skills						
- Vice President of Finance / Chief Financial Officer	11	0.27	0.13	1.00	-1.09	1.35
Provost / Vice President of Academic Affairs	3	-7.7E-17				
- Executive Vice President / Chief Operations Officer	5	4.4E-17	0.00	1.00	-1.65	1.65
- President	5	0.40	-0.40	0.95	-2.05	1.25
- Vice President of Administration	1	4.00	-4.00	0.00	-6.61	-1.39
- Vice President of Finance / Chief Financial Officer	11	0.27	-0.27	0.98	-1.75	1.20

(continued)

Comparison Groups	Count	Mean	Mean Diff.	P-Value	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
Vice President of Administration	1	4.00				
- Executive Vice President / Chief Operations Officer	5	4.4E-17	4.00	0.00	1.52	6.48
- President	5	0.40	3.60	0.00	1.12	6.08
- Provost / Vice President of Academic Affairs	3	-7.7E-16	4.00	0.00	1.39	6.61
- Vice President of Finance / Chief Financial Officer	11	0.27	3.73	0.00	1.37	6.09
Vice President of Finance / Chief Financial Officer	11	0.27				
- Executive Vice President / Chief Operations Officer	5	4.4E-17	0.27	0.96	-0.95	1.49
- President	5	0.40	-0.13	1.00	-1.35	1.09
- Provost / Vice President of Academic Affairs	3	-7.7E-16	0.27	0.98	-1.20	1.75
- Vice President of Administration	1	4.00	-3.73	0.00	-6.09	-1.37

The data revealed other factors that impacted certain future characteristics and certain characteristics ranking. These factors include age, membership on president's council and institutions denominational affiliation.

Cross tabulation of the data for president's council membership compared to future characteristics showed that a larger than expected number of CIOs serving on president's council strongly agreed that strategic planning is a needed future characteristic. Conversely, a larger than expected number of CIOs not serving on president's council agreed that strategic planning is a needed future characteristic (see table 14).

Table 14.

Cross Tabulation for President's Council Membership and Future Characteristic (n=27)

Scale		President's council member	Not president's council member	Total
Strategic Planning				
Agree	Count	1	6	7
	Expected Count	3.6	3.4	7
Strongly Agree	Count	13	7	20
	Expected Count	10.4	9.6	20

An analysis of variance was conducted to determine if the age of CIOs impacted the ranking of the top six characteristics needed for the future. Table 15 illustrates that CIOs 60 years and over ranked the characteristics IT knowledge (p-level = 0.016) and influencing technology direction (IT evangelist) (p-level = 0.027) higher than all the other age groups. CIOs between the ages of 40-49 years ranked the characteristic measuring performance / analytics (p-level = 0.04) higher than all the other groups.

Table 15.

Difference between Age and Characteristics Ranking

Comparison Groups	Count	Mean	Mean Difference	P-Value	95% Confidence Interval Lower Bound	Upper Bound
IT Knowledge (n=26)						
30-39	5	1.8E-15				
- 40-49	8	0.75	-0.75	0.82	-3.15	1.65
- 50-59	10	0.40	-0.40	0.96	-2.71	1.91
- 60-69	3	3.67	-3.67	0.02	-6.75	-0.59
40-49	8	0.75				
- 30-39	5	1.8E-15	0.75	0.82	-1.65	3.15
- 50-59	10	0.4	0.35	0.96	-1.65	2.35
- 60-69	3	3.67	-2.92	0.04	-5.77	-0.06

(continued)

Comparison Groups	Count	Mean	Mean Difference	P-Value	95% Confidence Interval Lower Bound	Upper Bound
50-59	10	0.4				
- 30-39	5	1.8E-15	0.40	0.96	-1.91	2.71
- 40-49	8	0.75	-0.35	0.96	-2.35	1.65
- 60-69	3	3.67	-3.27	0.02	-6.04	-0.49
60-69	3	3.67				
- 30-39	5	1.8E-15	3.67	0.02	0.59	6.75
- 40-49	8	0.75	2.92	0.04	0.06	5.77
- 50-59	10	0.4	3.27	0.02	0.49	6.04
Influence Technology Direction (IT Evangelist) (n=25)						
30-39	5	4.44E-16				
- 40-49	7	1.00	-1.00	0.74	-3.73	1.73
- 50-59	10	1.50	-1.50	0.38	-4.05	1.05
- 60-69	3	4.00	-4.00	0.02	-7.40	-0.60
40-49	7	1				
- 30-39	5	4.44E-16	1.00	0.74	-1.73	3.73
- 50-59	10	1.50	-0.50	0.93	-2.80	1.80
- 60-69	3	4.00	-3.00	0.07	-6.22	0.22
50-59	10	1.50				
- 30-39	5	4.44E-16	1.50	0.38	-1.05	4.05
- 40-49	7	1.00	0.50	0.93	-1.80	2.80
- 60-69	3	4.00	-2.50	0.14	-5.57	0.57
60-69	3	4				
- 30-39	5	4.44E-16	4.00	0.02	0.60	7.40
- 40-49	7	1.00	3.00	0.07	-0.22	6.22
- 50-59	10	1.50	2.50	0.14	-0.57	5.57

(continued)

Comparison Groups	Count	Mean	Mean Difference	P-Value	95% Confidence Interval Lower Bound	Upper Bound
Measuring Performance / analytics (n=26)						
30-39	5	0.40				
- 40-49	8	2.25	-1.85	0.18	-4.29	0.59
- 50-59	10	0.20	0.20	1.00	-2.15	2.55
- 60-69	3	2.22E-16	0.40	0.98	-2.73	3.53
40-49	8	2.25				
- 30-39	5	0.40	1.85	0.18	-0.59	4.29
- 50-59	10	0.20	2.05	0.05	0.02	4.08
- 60-69	3	2.22E-16	2.25	0.17	-0.65	5.15
50-59	10	0.20				
- 30-39	5	0.40	-0.20	1.00	-2.55	2.15
- 40-49	8	2.25	-2.05	0.05	-4.08	-0.02
- 60-69	3	2.22E-16	0.20	1.00	-2.62	3.02
60-69	3	2.22E-16				
- 30-39	5	0.40	-0.40	0.98	-3.53	2.73
- 40-49	8	2.25	-2.25	0.17	-5.15	0.65
- 50-59	10	0.20	-0.20	1.00	-3.02	2.62

The next analysis of variance conducted was to determine if the institutions denominational affiliation impacted the ranking of the top six characteristics needed for the future. Table 16 shows that CIOs at non-denominational institutions ranked emotional intelligence (p-level = 0.01) higher than all the other denominations. CIOs at Baptist institutions ranked political savvy (p-level= 0.02) higher than the CIOs at non-denominational, Presbyterian, and Wesleyan/Methodist institutions.

Table 16.

Difference between Institutions Denominational Affiliation and Characteristics Ranking

Comparison Groups	Count	Mean	Mean Difference	P-Value	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
Emotional Intelligence (n=24)						
Baptist	5	0.40				
- Non-denomination	7	2.29	-1.89	0.06	-3.81	0.04
- Other	5	-2.2E-16	0.40	0.98	-1.68	2.48
- Presbyterian	3	1.1E-16	0.40	0.99	-2.00	2.80
- Wesleyan/Methodist	4	1.1E-16	0.40	0.98	-1.80	2.60
Non-denomination	7	2.29				
- Baptist	5	0.40	1.89	0.06	-0.04	3.81
- Other	5	-2.2E-16	2.29	0.02	0.36	4.21
- Presbyterian	3	1.1E-16	2.29	0.05	0.02	4.55
- Wesleyan/Methodist	4	1.1E-16	2.29	0.03	0.23	4.35
Other	5	-2.2E-16				
- Baptist	5	0.40	-0.40	0.98	-2.48	1.68
- Non-denomination	7	2.29	-2.29	0.02	-4.21	-0.36
- Presbyterian	3	1.1E-16	-3.3E-16	1.00	-2.40	2.40
- Wesleyan/Methodist	4	1.1E-16	-3.3E-16	1.00	-2.20	2.20
Presbyterian	3	1.110E-16				
- Baptist	5	0.40	-0.40	0.99	-2.80	2.00
Political Savvy (n=25)						
Baptist	6	2.83				
- Non-denomination	7	0.14	2.69	0.05	-0.04	5.42
- Other	5	1.00	1.83	0.38	-1.14	4.81
- Presbyterian	3	-1.1E-16	2.83	0.15	-0.64	6.31
- Wesleyan/Methodist	4	2.2E-16	2.83	0.09	-0.34	6.00
Non-denomination	7	0.14				
- Baptist	6	2.83	-2.69	0.05	-5.42	0.04
- Other	5	1.00	-0.86	0.90	-3.73	2.02
- Presbyterian	3	-1.1E-16	0.14	1.00	-3.25	3.53
- Wesleyan/Methodist	4	2.2E-16	0.14	1.00	-2.93	3.22

(continued)

Comparison Groups	Count	Mean	Mean Difference	P-Value	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
Other	5	1.00				
- Baptist	6	2.83	-1.83	0.38	-4.81	1.14
- Non-denomination	7	0.14	0.86	0.90	-2.02	3.73
- Presbyterian	3	-1.1E-16	1.00	0.92	-2.59	4.59
- Wesleyan/Methodist	4	2.2E-16	1.00	0.89	-2.29	4.29
Presbyterian	3	-1.1E-16				
- Baptist	6	2.83	-2.83	0.15	-6.31	0.64

Research Question 4. How do organizational demographics impact the state of the CIO in regards to reporting structure and title of the CIO?

A Chi-square analysis of size of the institution, denominational affiliation, and being a member of president's council and reporting structure resulted in a probability level of 0.282, 0.840, and 0.001, respectively. At the .05 alpha level, the null hypothesis is accepted that organizational demographics – size of institution and denominational affiliation – do not impact the reporting structure of the CIO. At the .05 alpha level the null hypothesis is rejected and concludes that the member of president's council organizational demographic is impacted by reporting structure (see Table 17).

Table 17.

Reporting Structure Distribution of Respondents Membership on President's Council

Report To	President's Council Member	Not President's Council Member
President	6	0
Executive VP/ COO	3	2
VP, Finance/CFO	1	11
Other	4	0

A Chi-square analysis of size of the institution, denominational affiliation, being a member of president's council and CIO title resulted in a probability level of 0.21, 0.10, and 0.47, respectively. At the .05 alpha level, the null hypothesis is accepted that organizational demographics does not impact the tile of the CIO.

Table 18 shows that the CIO's age impacts membership of the president's council. Fewer CIOs between the age of 30-39 years serve on president's council than expected, while disproportionately more CIOs between the age of 50-59 years serve.

Table 18.

Age Distribution of Respondents Membership on President's Council

Age	President's Council Member	Not President's Council Member
30-39	1	5
40-49	4	4
50-59	9	1
60-69	0	3

Summary

This study explored the current state of CIOs at CCCU institutions, their perception of characteristics needed for future CIO success, and the impact organizational design had on future needed characteristics. The data revealed significant findings. The CIO's position title (director or vice president) impacts the CIO role title. Directors are less likely to also have the CIO title.

Size of the institution impacted the current characteristics. CIOs at schools with less than 2,000 students identified influencing technology direction was less important than schools with more than 2,000 students, while CIOs at schools with fewer than 2,000 students identified being a change agent more important.

Reporting structure impacted the perception of needed future characteristics. CIOs reporting to the president disproportionately strongly agreed that access to the president is a needed future characteristic. CIOs reporting to the president also disproportionately agreed that portfolio management is a needed future characteristic.

Organizational demographics such as size of institution, denominational affiliation and being a member of the president's council do not impact the CIO's position title. Size of organization and denominational affiliation does not impact the reporting structure of the CIO. Being a member of the president's council is impacted by reporting structure, however. CIOs reporting to the CFO are typically not a member of president's council, while CIOs reporting to the president are members of the president's council.

The six most critical characteristics needed over the next 20 year as identified by CIOs were strategic planning, communication skills, vision, managing relations within the institution, managing resources, and influencing technology direction (IT evangelist).

Chapter 5 discusses findings and recommendations based on this research study. Chapter 5 explores other factors that impacted the self-reported characteristics of CIOs, as well as suggestions for future research.

Chapter 5: Findings, Recommendations, and Conclusion

This chapter presents a review of the study to identify which characteristics an effective CIO at a faith-based college or university needs. Included in the chapter are the restatement of problem and purpose statements, research questions, summary of the research methodology, key findings, recommendations, ideas for further research, and the conclusion.

Restatement of the Problem

Impacting the role of the CIO at a faith-based institution is the evolving role of the CIO, advances in technology, higher education and institutional culture, views on technology, the strategic use of technology and information, and the faith values of the school. Another dimension that might impact the CIO role is the denominational affiliation influence on institutional culture. Determining which characteristics are critical to be an effective CIO at a faith-based college or university, and determining if denominational affiliation influences the leader's characteristics are the prevailing need. Recent studies (Allison, 2010; Brown, 2009) compound the need by indicating that the first generation of CIOs plan to retire within the next 10 years. This is significant as the literature reveals that the role of the CIO is both complex and lacking clarity with regards to its career path, thus it is questionable how leaders will emerge to replace these CIO retirees. CIOs need new skills to succeed in their evolving role. The literature revealed a divergent viewpoint on skills needed with no specific set of characteristics needed for a CIO to be successful. Kitzis (2003) and Peppard (2010) suggest four common attributes, however -- communication (including listening), setting strategy, collaboration and delivery of service.

Restatement of the Purpose of the Study

The purpose of this study was to determine which characteristics an effective CIO at a faith-based college or university needs, to evaluate the impact organizational design had on the CIO role and these critical characteristics, and to determine if denominational affiliation influenced these necessary attributes. This descriptive study focused on the leadership characteristics of the senior IT leaders from the Council for Christian Colleges and Universities (CCCU, n.d.).

Research Objectives and Research Questions

With the need to identify and clarify a pathway for current and aspiring CIOs within the CCCU, by determining the critical characteristics needed for success and discovering any institutional factors that impact these characteristics, this study aimed to address the following research objectives:

- Determine the critical characteristics of CIOs at CCCU institutions
- Determine how denominational affiliations influence reporting structure at CCCU institutions
- Determine if organizational demographics impact CIO characteristics at CCCU institutions

Specifically, this study sought to address the following research questions:

1. What is the current state of the CIO in regards to reporting structure and title of the CIO?
2. What are the current self-reported characteristics of CIOs at CCCU institutions?
3. How does size and reporting structure of the institution impact CCCU CIO characteristics?

4. How do organizational demographics impact the state of the CIO in regards to reporting structure and title of the CIO?

Summary of Methodology

This study utilized a descriptive design method to analyze the data collected. The research design consisted of a survey instrument to determine the current state and characteristics of the CIO. The design was appropriate as the participants were asked to identify which characteristics an effective IT leader needs (Alreck & Settle, 2004).

A group of 117 CIOs from the CCCU completed an online survey about the institution's demographics, participant demographics, and perception of needed characteristics. The survey listed characteristics identified in the literature, as well as additional characteristics identified during the survey content and face validity phase of the study. Twenty-seven respondents completed the survey, with a response rate of 23 percent. Descriptive research requires a minimal sample of 10 percent. The researcher anticipated a higher than acceptable response rate due to the target population being interested in the topic and the study results (Groves, et.al., 2004).

Approximately 89 percent of CIO respondents were male. Approximately 48 percent of the respondents identified their age as 50 years or older. Eight-five percent of respondents served at an institution with fewer than 4,000 students. One third of the CIOs classified their institutions denominational affiliation as non-denominational; 22% were Baptist; 22% were Wesleyan /Methodist heritage, 11% were Presbyterian, and 11% were other.

Key Findings

This section summarizes findings as they relate to the research questions. There are additional findings revealed by this research study as well as comparisons described in other studies that relate to the findings.

Research Question 1. What is the current state of the CIO in regards to reporting structure and title of the CIO?

The CIOs in this study (CCCU) were similar to the CIOs in higher education as stated in the 2011 EDUCAUSE Center for Applied Research (ECAR) study (Arroway,et. al., 2011) in terms of the senior IT leader having CIO as part of their title (CCCU at 44% vs. ECAR at 45%), as well as serving on president's council (CCCU at 52% vs. ECAR at 50%). This study revealed a difference in the participants with a director title also having Chief Information Officer as part of their title, as only 1 of the 9 directors had the CIO title.

The data revealed a significant difference in reporting structure. The 2011 EDUCAUSE study reported slightly more than 30% of the participants reported to the president, and only 14% of the CIOs reported to the Chief Financial Officer (CFO). The current research study revealed just 22% of CIOs within the CCCU reported to the president, while the largest number (44%) reported to the CFO. The data shows an important difference in gender. The research bulletin, Women CIOs in Higher Education (Clark, 2012), cited two nationwide surveys reporting that since 2004 women have occupied the CIO position between 21.4% to 26% of the time. The current study shows that only 11% of CIOs within the CCCU are female.

The study showed meaningful differences in age with regards to time left until retirement. Basing retirement age at 65 years, the data revealed that fewer CIOs within the CCCU (11%)

will retire in the next 6 years compared to the ECAR study (31%); and fewer CCCU CIOs (33%) expect to retire over the next 10 years compared to the ECAR study of CIOs (52%).

Research Question 2. What are the current self-reported characteristics of CIOs at CCCU institutions?

Three survey questions provided participants the opportunity to express their perception regarding current and future characteristics needed to be a successful CIO, as well as rank the six most critical characteristics needed in twenty years.

Strategic planning was the characteristic that the greatest number of CIOs, 66.7% of the 27, rated very high as needed in their current position. Leadership characteristic was closely behind as 63% of the CIOs identified the rating was very high. Communication skills and delivery of service were tied with 59.3% of the CIOs rating these current characteristics very high. The remaining current needed characteristics above 50%, as identified by the CIOs as very high, were vision and trends (55.6%) and managing relationships within the institution (51.9%). The research found in the review of literature supported these six characteristics needed by CIOs for success in their current position. The most common characteristics identified in both the literature and by CIOs for their current position were strategic planning, vision and trends, and communication skills (Arroway, et. al., 2011; Fleit, 1988; Kitzis, 2003; Synnot, 1987; Waller, et. al., 2010). Not identified by CIOs as a needed current characteristic was business knowledge; however, it was identified by four authors in the review of literature.

The most needed future characteristic that the largest number of CIOs, 21 out of 27, or 77.8%, identified as strongly agreed was leadership. The second most needed characteristic for the future was strategic planning identified by 20 out of 27, or 74.1%, of the CIOs that strongly agreed. Tied with 18 out of 27, or 66.7%, of CIOs who strongly agreed were vision and trends

and communication skills. 17 out of 27, or 65.4%, of CIOs identified the characteristic managing relationships within the institution as strongly agreed. None of the remaining 26 future needed characteristics yielded a strongly agreed rating above 60%. The future characteristics identified by CIOs align with the review of literature. Identified in literature by only two authors (Arroway, et. al., 2011; Waller, et. al., 2010) was the characteristic leadership; it was the number one future needed characteristic identified by CIOs, however.

The CIOs ranked the six most critical CIO characteristics needed over the next twenty years. The top ranked characteristic identified by the CIOs was strategic planning (mean = 2.15). The second ranked characteristic was communication skills (mean = 2.04). The third ranked characteristic was vision and trends with a 1.73 mean. The fourth-, fifth-, and sixth- ranked characteristic needed by CIOs were: Managing relationships within the institution (mean = 1.69) -fourth, managing resources (mean = 1.35) -fifth, and influence technology direction (IT evangelist) (mean = 1.36) -sixth. The review of literature identified the top five ranked characteristics. An expert panelist identified influencing technology direction (IT evangelist) during the face validity test of the survey. Not identified in the top six most needed characteristics in twenty years was leadership, although identified for current needed characteristics as very high. CIOs also strongly agreed that leadership was a future needed characteristic. Not ranked or identified by CIOs as a future needed characteristic was business knowledge; although as previously stated, four authors in the review of literature identified it.

Research Question 3. How does size and reporting structure of the institution impact CCCU CIO characteristics?

Findings based on the impact that size of institution has on CIO characteristics revealed that CIOs at schools with more than 2,000 students identified the current characteristic, influencing technology direction (IT evangelist), as very high compared to CIOs at schools under 2,000 students. CIOs at schools under 2,000 students identified the current characteristic, change agent, very high as compared to CIOs at schools with more than 2,000 students.

CIOs at schools with 2,000 or more students strongly agreed that managing relationships outside the institution is a future needed characteristic as compared to CIOs at schools with less than 2,000 students. CIOs at schools with less than 2,000 students strongly agreed that IT skills and competencies is a future needed characteristic as compared to CIOs at schools with more than 2,000 students. Conversely, CIOs at schools with 2,000 or more students strongly disagreed that IT skills and competencies is a future needed characteristics as compared to CIOs at schools with less than 2,000 students.

Findings based on the impact reporting structure has on CIO characteristics showed that CIOs reporting to the president identified access to the president as high or very high compared to CIOs reporting to the CFO. Conversely, CIOs reporting to the CFO identified access to the president as medium or low compared to CIOs reporting to the president.

The data revealed other factors that impacted the CCCU CIO characteristics. The researcher limited analysis of other factors to future characteristics and ranking in order to align with the purpose of the study: to identify which characteristics an effective CIO at a faith-based college or university need. Additional analysis identified that membership on president's council impacted certain future characteristics, and that age and denominational affiliation impacted certain ranking of characteristics needed in twenty years.

Findings based on the impact that membership on president's council has on CIO characteristics revealed that CIOs serving on president's council strongly agreed that strategic planning was a future needed characteristic as compared to CIOs not serving on president's council. Conversely, CIOs not serving on president's council agreed that strategic planning was a future needed characteristic as compared to CIOs serving on president's council.

Findings based on the impact age had on the ranking of the top six characteristics needed for the future showed that CIOs who were 60 years and over ranked the characteristics IT knowledge and influencing technology direction (IT evangelist) higher than the other age groups. The finding that CIOs who were 60 and over rated influencing technology direction higher is significant as this characteristic is one of top six characteristics needed in the next twenty years. CIOs between 40-49 years ranked the characteristic measuring performance and analytics higher than all the other age groups.

Findings based on the impact the institutions denominational affiliation had on the ranking of the top six characteristics needed for the future identified that CIOs at non-denominational institutions ranked emotional intelligence higher than CIOs at the other denominational groups; and CIOs at Baptist institutions ranked political savvy higher than CIOs at non-denominational, Presbyterian, and Wesleyan/Methodist institutions.

Research Question 4. How do organizational demographics impact the state of the CIO in regards to reporting structure and title of the CIO?

Reporting structure, as previously analyzed in chapter 4, impacts membership on president's council. The findings show that CIOs who reported to CFOs are not members of president's council compared to CIOs reporting to the president, executive vice president, and

other. This is significant, as reported earlier, since CCCU CIOs report to CFOs at a higher rate than non-CCCU higher education institutions. An additional finding was that the CIO's age impacts membership on president's council. Fewer CIOs between the age of 30-39 years serve on president's council than expected, while disproportionately more CIOs between the age of 50-59 years serve. There were no significant findings that organizational demographics, such as size of institution, denominational affiliation, and being a member on president's council, impacted the CIOs title.

Recommendations

The role of the chief information officer must evolve from a position of control to a person of influence. The continuous progressing nature of technology, the expanding role and responsibilities of the CIO, and the changing dynamics of the institutional environment evidence the CIO role evolution (Broadbent & Kitzis, 2005; Hawkins & Marcum, 2002). The evolving CIO role requires new skills to succeed. The following are key recommendations to assist CCCU institutions and CIOs within the CCCU to evolve the CIO role:

1. Modify CIO development and recruitment strategies. The results of this study provide clarity concerning the top six critical characteristics for CIO success. The Commission on Technology (COT) within the CCCU is encouraged to cultivate professional development programs focusing on these six characteristics. The development emphasis from COT is critical as this study showed that CIOs within the CCCU are further from retirement than their peers at non-CCCU institutions. CIOs are encouraged to foster a culture influenced by these six characteristics, including staff development initiatives. CIOs should modify their job descriptions to include the top six critical characteristics needed in twenty years. Specifically, replace passive language with proactive language.

For instance, a current major responsibility to participate in strategic and operational governance processes of the organization could be stated influence the strategic and operational governance process of the organization. Another example is to replace a current major responsibility such as coordinate IT activities with those of other departments with serve as the IT evangelist by partnering with other departments. CIOs are encouraged to identify, develop and mentor prospective female CIOs, thus reducing the gap of female CIOs within the CCCU, as identified in this research study. For institutions hiring CIOs, evidence of the critical characteristics should be present in the selection of a final candidate.

2. Position IT strategically within the organization. Based on the findings of this study, to many CIOs report to CFOs, as compared to other higher education institutions. First, to better position IT, institutions are encouraged to change the CIO's reporting structure to the president, executive vice president or provost. As critical, this study revealed, there are individuals serving in the CIO role without the CIO title, especially a larger than expected number of individuals with the director title. Institutions should assign the CIO title to the senior-most IT person within the organization. A change in reporting structure assists with the second idea to improve IT's strategic position. This research revealed a significant difference between CIOs reporting to the president versus those reporting to the CFO, with regards to access to the president. The results of this study showed that CIOs need access to the president, especially female CIOs. If access is not through a direct reporting structure, then it needs to be through informal channels. Strategies to increase access include quarterly meetings to discuss strategic initiatives that technology can influence or annual meetings to discuss IT strategic objectives. The key is to integrate

the presidents' vision with technology direction. A third concept to increase IT's strategic position is through building partnerships across the institution. The fourth ranked top critical characteristic was managing relationships within the organization. Managing relationships provides a channel of communication between the CIO and their colleagues. Strategies for building partnerships include connecting with peers frequently, not just when there is an issue, and quarterly meetings with senior leadership to understand their strategic initiatives.

3. Change mindset, in order to be a visionary. A visionary leader envisions the future, communicates the direction, creates achievable goals, and relies on the contribution of others (McLaughlin, 2001). For CIOs within the CCCU, becoming a visionary leader may require connecting with CIOs at larger institutions, CIOs from a different industry, or both, to assist with identifying the next strategic technology initiative. After identifying an initiative, clearly and regularly communicate the objective. Next, develop the action plan and training to accomplish the vision. Achieving the vision will not happen overnight and will require intentional incremental steps. A critical part of accomplishing a vision, as stated above, is enlisting the help of others. One aspect of leadership is the ability to influence people; the ability to accomplish change through others (Haslam, Reicher, & Platow, 2013; MacArthur, 2010). This research study clarified the need for CIOs to influence technology direction. The review of literature did not identify influencing technology direction as a needed characteristic; however, this characteristic was the sixth top characteristic ranked by CIOs in this study. As an institutional visionary leader, the CIO needs to be a person of influence by serving as the IT evangelist. As a leader in a learning institution, shaping the institution's future use of

technology and information is critical, especially with academic leaders and faculty, in both the administrative aspects of academics and the learning ecosystem.

4. Aim to be a strategist balanced with solid operations. Recent literature affirms that a successful CIO must add value to the organization by balancing time between operational credibility and strategic thought (Broadbent & Kitzis, 2005; Holmes, 2006). CIOs in this study ranked strategic planning as the number one most critical characteristic needed for CIO success in twenty years. Conversely, delivery of service, although a top characteristic identified in the review of literature and identified as a top currently needed characteristic in this study, was not identified as a future needed characteristic or ranked in the top six critical characteristics in this study. According to the findings of this study, managing resources was the fifth most critical characteristic needed for CIO success in twenty years. Balancing strategic planning and managing resources, as affirmed in the review of literature, is critical for CIOs to be a trusted strategic partner. Finding the correct balance is especially true for CIOs with the director title within the CCCU, as previously mentioned. This study revealed a larger than expected number of directors who did not have the CIO role.

Conclusion and Suggestions for Further Research

Today, delivering value to the organization is the CIO's challenge: Tomorrow, the CIO will need to be a person of competence, awareness, and vision in order to bring optimum influence on the organization. The CIOs ability aid their institution in realizing its goals and mission is not only important for the CIO themselves but also for their institution; and perhaps, even more urgent for faith-based higher education as a whole.

Five broad implications have emerged from this study. Within the Council for Christian Colleges and Universities, CIOs report to the CFO at a higher rate than other higher education institutions; CIOs are further from retirement age than those at other higher education institutions; CIOs at larger schools, and CIOs who are 60 years and older, identified the characteristic of influencing technology direction as more important than other groups; access to the president was found to be more important to the president's direct reports; and membership on president's council is impacted by both reporting structure and age. In general, the reporting structure and importance of vision are largely school and denomination specific. Differences in structure reflect the uniqueness of faith-based institutions as compared to other higher education institutions. The impact that denominational affiliation and founder's influence has on faith-based institutions, especially in the role of information technology and the CIO, needs to be further researched. This is identified in the suggestions for further research.

This study identified the critical characteristics needed for CIOs within the CCCU over the next twenty years. The top six critical characteristics identified were: strategic planning, communication skills, vision and trends, managing relationships within the institution, managing resources, and influencing technology direction (IT evangelist). As discussed in Chapter 2, Katz (1989) states that senior leaders' effectiveness should focus on human and conceptual skills, while having a working knowledge of the technical skills. The characteristics identified as critical by CIOs align with Katz' skills framework, as the first five top ranked characteristics are either conceptual or human skills (see table 3). Influencing technology direction, identified by expert, is also a conceptual skill. The senior IT leader can compensate for the lack of specific IT technical skills by employing individuals with strong technical skills; however, if their conceptual and human skillset is weak, the institution suffers.

The significance of this study was to clarify the critical characteristics needed by CIOs within the CCCU to effectively meet their institution's mission, while leading through such evolving and complex role.

Although this study has identified the future characteristics needed for a CIOs success, a greater understanding of how organizational design impacts these characteristics is necessary. Following are four recommendations for further research. The first recommendation is to identify CIOs that only have chief information officer as their title. Study these CIOs to discover whether the absence of a position title (director or vice president) impacts their ability to achieve the top six needed characteristics. Also, study these CIOs to determine if the absence of position title impacts their equality to other chief executives. The second recommendation is to perform a study to determine if faith based institutions place a higher emphasis on the characteristic of managing relationships within the institution than non-faith based institutions. The third recommendation is to replicate this study with a larger number of targeted denominational affiliations to determine if CIOs' perceptions of characteristics differ by denominational affiliation. Conducting interviews, in addition to the survey, may provide a deeper understanding of any differing perceptions based on denominational affiliation. The fourth recommendation is to identify the CIOs who are successfully modeling the top six needed characteristics at their institutions. Study these CIOs and measure their success, specifically their ability to influence technology direction.

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APPENDIX A

Email Sent to Participants

Dear << First Name >>,

My name is Don Davis, CIO at Azusa Pacific University. I am a doctoral student in Learning Technologies at Pepperdine University's Graduate School of Education and Psychology. As the senior IT leader (CIO) at your institution, **I am emailing you to ask for your participation in my study**: A Study of the Characteristics Needed by Information Technology Leaders in Faith-Based Higher Educational Institutions.

The purpose of this study is to determine which characteristics are needed to be an effective CIO at a faith-based college or university, and to determine how organizational design influences these needed characteristics. The study will focus on the leadership characteristics of senior IT leaders from the Council for Christian Colleges and Universities (CCCU), and will also evaluate the impact of organizational design on the CIO role at these faith-based institutions. Please understand that your participation in my study is strictly voluntary.

If you should decide to participate in the study, you will be asked to complete an online survey. The first part of the survey is designed to gather current status about the CIO and institutional demographics. In the second part you will provide assessment concerning characteristics needed by current and future CIOs. **The survey should take approximately 10 to 15 minutes to complete.**

The data collected will be anonymous and confidential, and only summarized information will be shared. There is minimal risk in participating in the survey, however the results will be of great benefit. The goal of the study is to provide clarity for current and future CIOs on the characteristics needed to be a successful CIO at a CCCU institution. I anticipate sharing the results at the annual CCCU IT conference, so a high response rate will greatly increase the validity of the results.

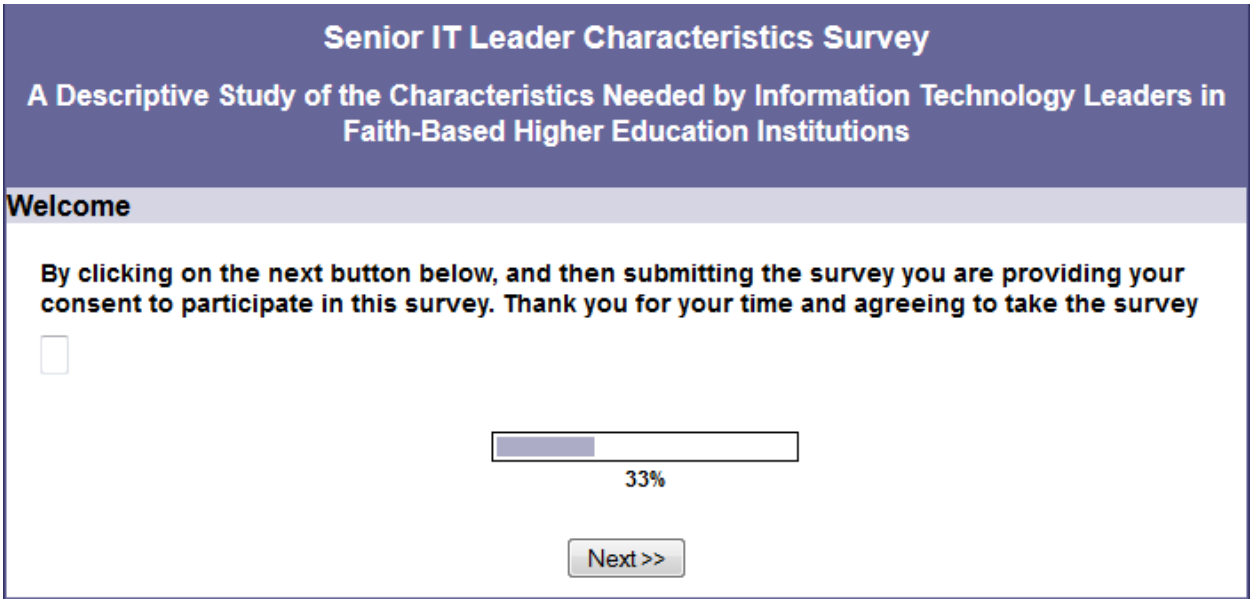
By clicking on the link below, and then submitting the survey in the end, you are agreeing to participate in the study
Senior IT Leader Characteristics Survey

Thank you,
Don Davis
Vice President / CIO
Azusa Pacific University

Ed.D. Candidate
Pepperdine University
Graduate School of Education and Psychology

APPENDIX B

Survey Instrument



Senior IT Leader Characteristics Survey

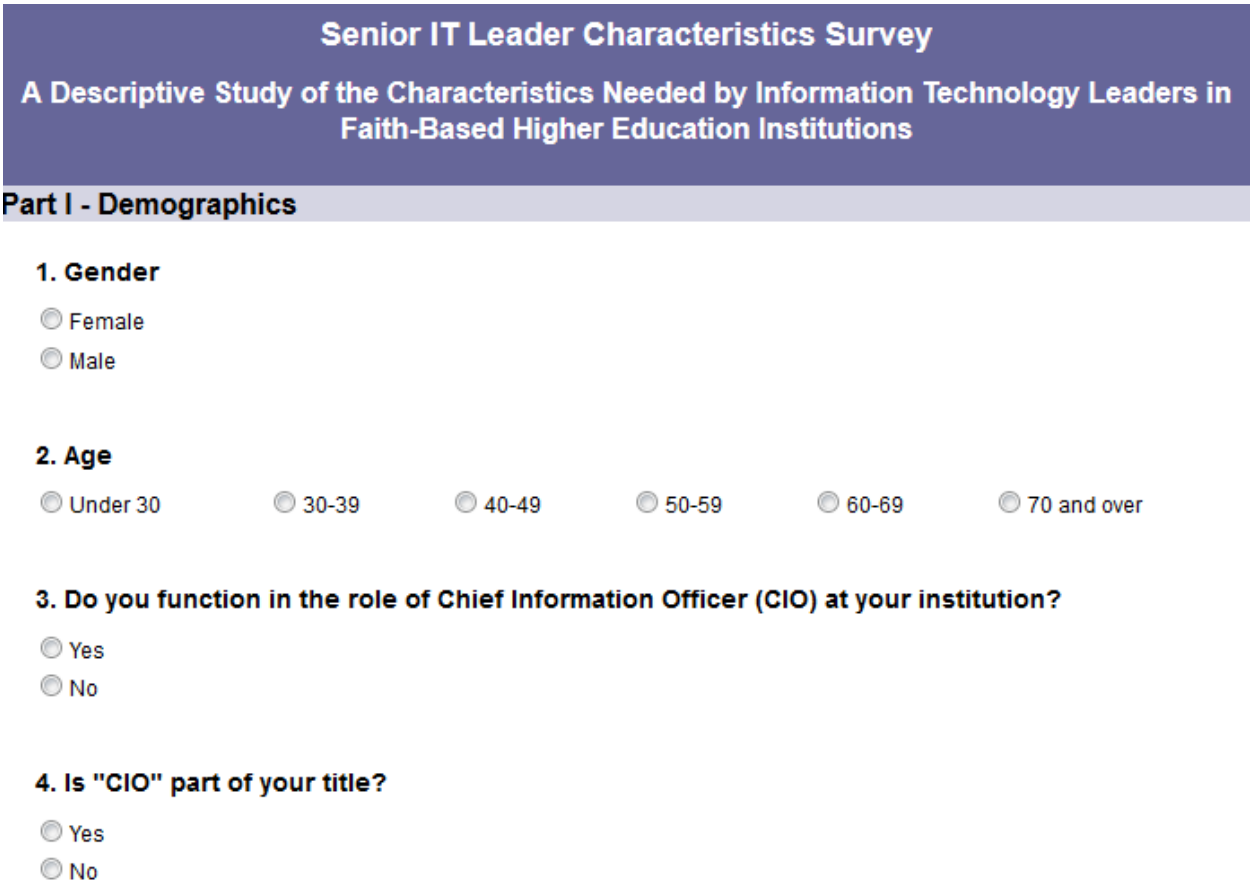
A Descriptive Study of the Characteristics Needed by Information Technology Leaders in Faith-Based Higher Education Institutions

Welcome

By clicking on the next button below, and then submitting the survey you are providing your consent to participate in this survey. Thank you for your time and agreeing to take the survey

33%

Next >>



Senior IT Leader Characteristics Survey

A Descriptive Study of the Characteristics Needed by Information Technology Leaders in Faith-Based Higher Education Institutions

Part I - Demographics

1. Gender

- Female
- Male

2. Age

- Under 30
- 30-39
- 40-49
- 50-59
- 60-69
- 70 and over

3. Do you function in the role of Chief Information Officer (CIO) at your institution?

- Yes
- No

4. Is "CIO" part of your title?

- Yes
- No

5. What is your title / position

- ○ Vice President / Provost
- ○ Associate Vice President / Provost
- ○ Assistant Vice President / Provost
- ○ Executive Director
- ○ Director
- ○ Manager
- ○ Other (please specify)

6. To whom do you report?

- ○ President
- ○ Executive Vice President / Chief Operations Officer
- ○ Provost / Vice President of Academic Affairs
- ○ Vice President of Administration
- ○ Vice President of Finance / Chief Financial Officer
- ○ Vice Provost / Associate Provost
- ○ Other (please specify)

7. Are you a member of Presidents Cabinet or Council?*

- ○ Yes
- ○ No

8. What is your student FTE (Please use number reported to IPEDS)? *

- ○ Less than 1,999
- ○ 2,000 to 3,999
- ○ 4,000 to 5,999
- ○ 6,000 to 7,999
- ○ 8,000 to 9,999
- ○ 10,000 or more

9. What is your school's denominational affiliation?*

- Non-denomination
- Baptist
- Presbyterian
- Lutheran
- Assemblies of God
- Church of God
- Church of Christ
- Christian Reformed Church
- Nazarene
- Evangelical Free
- Free Methodist
- Wesleyan
- Mennonite
- Christian Missionary Alliance
- Friends
- Other (please specify)

67%

<< Prev Next >>

* are questions that are required to be answered

Senior IT Leader Characteristics Survey

A Descriptive Study of the Characteristics Needed by Information Technology Leaders in Faith-Based Higher Education Institutions

Part II - Critical Characterisitcs

10. Assess the importance of the following characteristics for success in your current position/role:

	Very High	High	Medium	Low	Very Low
Vision / Trends					
Strategic planning					
Making tough decisions					
Communication skills					
Negotiation skills					

Marketing skills					
Policy maker					
Influence technology direction (IT evangelist)					
Reporting structure					
Access to president					
Managing relationships within your institution					
Managing relationships outside your institution					
Managing resources					
IT Knowledge					
IT skills / competencies					
Political savvy					
Business knowledge (processes and operations)					
Education (own)					
Measuring performance / Analytics					
Delivery of service					
Change agent					
Personal development					
Leadership					
Emotional intelligence					
Professional development (Team)					
Collaboration					
Project management					
Portfolio management					
Operational management					
Financial management					
Risk management					

11. Indicate your level of agreement regarding the need of each characteristic for CIO success over the next 20 years in a futuristic position/role:

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Vision / Trends					
Strategic planning					
Making tough decisions					

Communication skills					
Negotiation skills					
Marketing skills					
Policy maker					
Influence technology direction (IT evangelist)					
Reporting structure					
Access to president					
Managing relationships within your institution					
Managing relationships outside your institution					
Managing resources					
IT Knowledge					
IT skills / competencies					
Political savvy					
Business knowledge (processes and operations)					
Education (own)					
Measuring performance / Analytics					
Delivery of service					
Change agent					
Personal development					
Leadership					
Emotional intelligence					
Professional development (Team)					
Collaboration					
Project management					
Portfolio management					
Operational management					
Financial management					
Risk management					

12. Select the characteristics you believe are the six MOST critical characteristics for CIO's over the next 20 years (1 being most important). Six characteristics will be ranked, please select "Not in Top 6" for the remaining characteristics.

	Ranking
Vision / Trends	-- select --
Strategic planning	-- select --
Making tough decisions	-- select --
Communication skills	-- select --
Negotiation skills	-- select --
Marketing skills	-- select --
Policy maker	-- select --
Influence technology direction (IT evangelist)	-- select --
Reporting structure	-- select --
Access to president	-- select --
Managing relationships within your institution	-- select --
Managing relationships outside your institution	-- select --
Managing resources	-- select --
IT Knowledge	-- select --
IT skills / competencies	-- select --
Political savvy	-- select --
Business knowledge (processes and operations)	-- select --
Education (own)	-- select --
Measuring performance / Analytics	-- select --
Delivery of service	-- select --
Change agent	-- select --
Personal development	-- select --
Leadership	-- select --
Emotional intelligence	-- select --
Professional development (Team)	-- select --
Collaboration	-- select --

Project management	-- select --
Portfolio management	-- select --
Operational management	-- select --
Financial management	-- select --
Risk management	-- select --

13. Are there any critical CIO characteristic(s) missing from the list in item #12 (above)? If there are no characteristics missing, answer "n/a"

Any further comments?

100%

<< Prev Submit

APPENDIX C

Alphabetical List of Characteristics

Access to president
Business knowledge / processes and operations
Change agent
Collaboration
Communication skills
Delivery of service
Education own
Emotional intelligence
Financial management
Influence technology direction (IT evangelist)
IT Knowledge
IT skills /competencies
Leadership
Making tough decisions
Managing relationships outside your institution
Managing relationships within your institution
Managing resources
Marketing skills
Measuring performance / analytics
Negotiation skills
Operational management
Personal development
Policy maker
Political savvy
Portfolio management
Professional development (team)
Project management
Reporting structure
Risk management
Strategic planning
Vision / Trends

APPENDIX D

Protection of Human Subject Research Completion Report

COLLABORATIVE INSTITUTIONAL TRAINING INITIATIVE (CITI)

GRADUATE & PROFESSIONAL SCHOOL SOCIAL & BEHAVIORAL RESEARCH - BASIC/REFRESHER CURRICULUM COMPLETION REPORT

Printed on 05/30/2014

LEARNER	Donald Davis (ID: 3946997)
DEPARTMENT	GSEP
EMAIL	dhdavis@pepperdine.edu
INSTITUTION	Pepperdine University
EXPIRATION DATE	03/07/2017

SOCIAL & BEHAVIORAL RESEARCH - BASIC/REFRESHER : Choose this group to satisfy CITI training requirements for investigators and staff involved primarily in Social/Behavioral Research with human subjects.

COURSE/STAGE:	Basic Course/1
PASSED ON:	03/08/2014
REFERENCE ID:	12111865

REQUIRED MODULES	DATE COMPLETED	SCORE
Belmont Report and CITI Course Introduction	01/17/14	3/3 (100%)
Students in Research	01/17/14	10/10 (100%)
History and Ethical Principles - SBE	01/17/14	4/5 (80%)
Defining Research with Human Subjects - SBE	01/17/14	5/5 (100%)
The Regulations - SBE	01/17/14	5/5 (100%)
Assessing Risk - SBE	01/17/14	4/5 (80%)
Informed Consent - SBE	01/17/14	5/5 (100%)
Privacy and Confidentiality - SBE	02/07/14	3/5 (60%)
Research with Prisoners - SBE	02/07/14	4/4 (100%)
Research with Children - SBE	02/07/14	4/4 (100%)
Research in Public Elementary and Secondary Schools - SBE	02/07/14	4/4 (100%)
International Research - SBE	02/07/14	3/3 (100%)
Internet Research - SBE	02/07/14	3/5 (60%)
Research and HIPAA Privacy Protections	03/08/14	4/5 (80%)
Vulnerable Subjects - Research Involving Workers/Employees	03/08/14	4/4 (100%)
Conflicts of Interest in Research Involving Human Subjects	03/08/14	2/5 (40%)

For this Completion Report to be valid, the learner listed above must be affiliated with a CITI Program participating institution or be a paid independent Learner. Falsified information and unauthorized use of the CITI Progam course site is unethical, and may be considered research misconduct by your institution.

Paul Braunschweiger Ph.D.
Professor, University of Miami
Director Office of Research Education
CITI Program Course Coordinator

APPENDIX E

IRB Approval

PEPPERDINE UNIVERSITY

Graduate & Professional Schools Institutional Review Board

July 22, 2014

Donald H. Davis

Protocol #: E0614D03
Project Title: A Descriptive Study of the Characteristics Needed by Information Technology Leaders in Faith-Based Higher Educational Institutions

Dear Mr. Davis,

Thank you for submitting your application, *A Descriptive Study of the Characteristics Needed by Information Technology Leaders in Faith-Based Higher Educational Institutions,* for exempt review to Pepperdine University's Graduate and Professional Schools Institutional Review Board (GPS IRB). The IRB appreciates the work you and your faculty advisor, Dr. Eric Hamilton, have done on the proposal. The IRB has reviewed your submitted IRB application and all ancillary materials. Upon review, the IRB has determined that the above entitled project meets the requirements for exemption under the federal regulations (45 CFR 46 - http://www.nihtraining.com/ohsrsite/guidelines/45cfr46.html) that govern the protections of human subjects. Specifically, section 45 CFR 46.101(b)(2) states:

> (b) Unless otherwise required by Department or Agency heads, research activities in which the only involvement of human subjects will be in one or more of the following categories are exempt from this policy:
>
> **Category (2) of 45 CFR 46.101**, research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures or observation of public behavior, unless: a) Information obtained is recorded in such a manner that human subjects can be identified, directly or through identifiers linked to the subjects; and b) any disclosure of the human subjects' responses outside the research could reasonably place the subjects at risk of criminal or civil liability or be damaging to the subjects' financial standing, employability, or reputation.

In addition, **your application to waive documentation of informed consent has been approved.**

Your research must be conducted according to the proposal that was submitted to the IRB. If changes to the approved protocol occur, a revised protocol must be reviewed and approved by the IRB before implementation. For any proposed changes in your research protocol, please submit a **Request for Modification Form** to the GPS IRB. Because your study falls under exemption, there is no requirement for continuing IRB review of your project. Please be aware that changes to your protocol may prevent the research from qualifying for exemption from 45 CFR 46.101 and require submission of a new IRB application or other materials to the GPS IRB.

A goal of the IRB is to prevent negative occurrences during any research study. However, despite our best intent, unforeseen circumstances or events may arise during the research. If an unexpected situation or adverse event happens during your investigation, please notify the GPS IRB as soon as possible. We will ask for a complete explanation of the event and your response. Other actions also may be required depending on the nature of the event. Details regarding the timeframe in which adverse events must be reported to the GPS IRB and the appropriate form to be used to report this information can be found in the *Pepperdine University Protection of Human Participants in Research: Policies and Procedures Manual* (see link to "policy material" at http://www.pepperdine.edu/irb/graduate/).

Please refer to the protocol number denoted above in all further communication or correspondence related to this approval. Should you have additional questions, please contact Kevin Collins, Manager of the Institutional Review Board (IRB) at gpsirb@peppderdine.edu. On behalf of the GPS IRB, I wish you success in this scholarly pursuit.

Sincerely,

Thema Bryant-Davis, Ph.D.
Chair, Graduate and Professional Schools IRB

cc: Dr. Lee Kats, Vice Provost for Research and Strategic Initiatives
Mr. Brett Leach, Compliance Attorney
Dr. Eric Hamilton, Faculty Chair