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The Changing Role of CIO: From IT Leader to Corporate Strategist

CAPSTONE REPORT

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Abstract

for

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This paper examines the changing role of the Chief Information Officer (CIO) in large technology organizations, from 1995 – 2005. Using a pre-defined set of nine CIO leadership roles (Gottschalk, 2001), a content analysis is conducted to determine which CIO leadership roles have become more predominant. Conclusions are presented in a timeline graph (Corda, 2004) and a composite set of key job responsibilities in a current CIO job description, for use by executive recruitment teams.

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CHAPTER I - PURPOSE OF STUDY

Brief Purpose

The purpose of this study is to define the changing role of Chief Information Officer (CIO) (Penrod, Dolence, Douglas, 1990), as it has existed during the past decade in large size (Taylor, 1995), for-profit organizations in the technology sector. The study is organized in a historical manner, taking a chronological approach to the examination of leadership roles of the CIO, as a way to document fundamental changes in the role during the Web-based era (Ross & Feeny, 1999). The Web-based era is defined by Ross & Feeny (1999) as the mid-1990s to present time. The outcome of this study, designed as a composite “responsibilities” section of a job description (Ojimba, 2004) for the position of CIO and a timeline graph (Corda, 2005), is intended to provide the executive teams, including CIOs, of large organizations with an understanding of what the role consists of today according to the collected literature and how it has evolved during the Web-based era. The assumption is that this understanding can assist in evaluating the importance of clearly identifying a specific set of responsibilities for the CIO position today, in relation to the organizations’ current business goals.

Penrod, Dolence and Douglas (1990) traced the earliest mention of the term CIO back to 1980. At that time, they asserted that CIOs were commonly referred to as “Computer Czars” (p.1). By the beginning of the Web-based era, Stephens (1995) stated that the role of CIO was starting to shift from IT manager to an executive with influence on organizational strategy. In 2000, Raths (2000) stated that commercial organizations were recognizing that IT was driving revenue growth. In 2001, Gottschalk specifically called out nine different leadership roles associated with the CIO position. By 2004, Weiss and Anderson wrote that the CIO was often the only top-level executive who could effectively lead enterprise-wide initiatives aimed at

aligning IT with business processes. And just last year, in 2005, a study conducted by The META Group that surveyed over 100 senior IT respondents, entitled *CIO As Enterprise Change Agent*, suggests that a new generation of CIOs armed with specialized IT knowledge and experience are able to significantly influence business decisions on an enterprise level (Waller).

The method of this study is a literature review with an historical approach (Leedy & Ormrod, 2001). The collection of literature is focused on works published during the Web-based era (Ross & Feeny, 1999). The identified sources, published between 1995 and 2005, are selected for analysis if they contain assertions pertaining to leadership roles of the CIO. A content analysis strategy (Palmquist, Busch, De Maret, Flynn, Kellum, Le, et al., 2005) is utilized to identify patterns and themes in the selected literature, addressing the evolving role of the CIO throughout this timeframe. Results from the content analysis are presented in a summary table that documents CIO leadership roles over time (see Table 2 Template in Figure 5). A timeline graph displaying the changing role of the CIO is also provided. Then these results are re-framed into a sample “responsibilities” section of a job description (Ojimba, 2004) for the CIO position, in relation to the year 2006. This job description can be used by executives to compare the current responsibilities of their organization’s CIO position to the variety of CIO leadership roles, defined during the Web-based era (Ross & Feeny, 1999).

Full Purpose

For most technology organizations, no other role among senior executives remains more inconsistently defined than the role of Chief Information Officer (Lepore, 2000). At the onset of the Web-based era (Ross & Feeny 1999), the position of CIO was occupied by an IT manager, and thus, consisted of mainly technical responsibilities (Raths, 2000). According to Ross & Feeny (1999), for most organizations, the Web-based era started in the mid-1990s “with a rapidly growing emphasis on the use of Internet and web protocols to drive both internally and externally oriented applications of IT” (p.3). The primary function of IT, at this time, was technology assessment and systems implementation (Byrnes, 2005). The IT department operated in isolation from the rest of the company, maintaining the organization’s network of servers and personal computers (Hirschheim, Porra, Parks, 2003).

Once organizations realized that business processes could be improved and made more efficient through the effective use of IT (Raths, 2000), the CIO was introduced to a series of new challenges. New applications aimed at automating business processes were acquired, customized and implemented, or built entirely in-house by IT (Hirschheim, Porra, Parks, 2003). Early attempts often resulted in a working solution, however, due to insufficient collaboration between business and technology, these new systems were ultimately considered failures because “business processes had not changed” (Byrnes, 2005, par. 5). Two common examples are failure to realize the full capabilities of the newly implemented application and failure to properly synch the original business process with the new solution (Byrnes, 2005). All of this ostensibly happened under the direction and oversight of the CIO. According to Hirschheim, Porra and Parks (2003), this led to the perception among senior executives that IT was not fulfilling its promises, and furthermore, the CIO was held responsible for the failures.

Organizational consultants began to look for remedies, in particular with regard to the abilities of the CIOs. A variety of fundamental attributes emerged and were solidified by Gottschalk (2001), a leading researcher in the field of IT management. Gottschalk created a set of nine critical management attributes by combining ideas originally established by Mintzberg (1990), a well-respected academic and author on business and management, with another set identified by the Computer Sciences Corporation (1996), a consulting firm with nearly 50 years of experience in the field of information technology. The ideas of Mintzberg (1990) comprise the first three of the nine and emerged from research conducted within the managerial discipline. These three attributes are innately focused on leadership style and include informational, decisional and interpersonal roles. The remaining set of six, which come from the CSC (1996), is grounded in organizational development theory, and thus, is functionally oriented and focuses on leadership activities. Functional attributes include Chief Architect, Change Leader, Product Developer, Technology Provocateur, Coach and Chief Operating Strategist. This combined set of CIO leadership roles is used as a foundation of this study – and forms the underlying approach to data analysis.

This study is conducted as a literature review (Leedy & Ormrod, 2005, p.64) where sources, published between 1995 and 2005, are selected based on the following criteria:

- contains information related to the role of CIO;
- contains information related to executive teams;
- contains information related to the landscape of technology organizations;
- discuss leadership roles for CIOs or executive management teams.

This researcher has chosen literature review as the research method in order to draw on others' published ideas and research efforts. The timeframe selected covers a period of almost 11 years and the dimension of historical time (Leedy & Ormrod, 2005, p.169) is key in understanding the chronology (Leedy & Ormrod, 2005, p.168) of events and interpreting the historical evolution of the data (Leedy & Ormrod, 2005, p.169).

The review of the literature is conducted using an interactive content analysis strategy (Palmquist, Busch, De Maret, Flynn, Kellum, Le, et al., 2005). This content analysis approach is flexible in that it allows for the use of an a priori coding set of concepts for identification of particular CIO leadership roles as defined in a set of nine, provided by Gottschalk (2001), as well as the identification of other CIO leadership roles as they emerge from the literature. In addition, during a second level of content analysis, words and phrases that describe the job responsibilities associated with each leadership role are noted.

Results of the conceptual analysis process are presented in a set of three tables. The first table (see Table 1 Template in Figure 4) lists the CIO leadership role(s) as well as any synonyms thereof that are identified within each source, the name of the source and the year published. This constitutes the result of the coding process for existence of CIO leadership roles. The second table (see Table 2 Template in Figure 5) summarizes the information contained within the first table by displaying the number of sources that contain mention of any specific CIO leadership role. The third table (see Table 3 Template in Figure 6) relates to the second level of analysis containing the associations of CIO leadership roles to identified job responsibilities.

The outcome of this study is intended to provide executives, including CIOs, within large technology organizations with a composite "responsibilities" section of the job description

(Ojimba, 2004) for the position of CIO, as it is envisioned today. As part of the final outcome of this study, a visual representation of the second table (see Table 2 Template in Figure 5) is provided in the form of a timeline graph (Corda, 2005) (template depicted in Figure 6). This graph shows the variance of each CIO leadership role during the Web-based era.

The primary audiences of this study are CIOs and senior executives in technology organizations. These individuals are leaders at the corporate level and are responsible for devising strategies and formulate policies aimed at meeting the organization's goals and objectives (U.S Department of Labor Statistics, 2006).

“Chief Information Officers are responsible for the overall technological direction of their organizations. They are increasingly involved in the strategic business plan of a firm as part of the executive team. To perform effectively, they also need knowledge of administrative procedures, such as budgeting, hiring, and supervision. These managers propose budgets for projects and programs and make decisions on staff training and equipment purchases. They hire and assign computer specialists, information technology workers, and support personnel to carry out specific parts of the projects. They supervise the work of these employees, review their output, and establish administrative procedures and policies. Chief information officers also provide organizations with the vision to master information technology as a competitive tool” (U.S Bureau of Labor Statistics, 2006, par.6).

This researcher intends that conclusions drawn from the comparison of the CIO composite job description to the way a CIO position currently exists in their organization can be used to help the executive team make educated decisions in better aligning CIO job responsibilities. For example, if senior executives discover by way of comparison that their

organization's CIO is spending more time carrying out the job responsibilities associated with a leadership role that has been deemed as one of lower priority, the executive team can use the outcome of the study to reset their CIO's time allocation to other job responsibilities that are associated with a more predominant CIO leadership role.

Limitations

Literature collected for this study is published between 1995 and 2005. According to Ross & Feeny (1999) this time period is known as the Web-based era, which can be defined as "starting for most in the mid 1990s, with rapidly growing emphasis on the use of Internet and web protocols to drive both internally and externally oriented applications of IT" (p.3). The Web-based era is chosen as a limitation for the research as this study is intended to define the changing role of CIO, meaning that the current profile of the role of CIO is the focus. It, furthermore, provides for a manageable number of texts to be analyzed.

This research only applies to large corporations as defined by Taylor (1995). Large corporations are organizations with at least 500 employees (Taylor, 1995). This limitation is chosen because the scope and complexity of the role of any executive, including the CIO, in a large size organization is not comparable to the same role in a small company (Taylor, 1995).

Literature collection is limited to literature discussing the role of CIO in for-profit organizations. This limitation is designed to ensure that data describing leadership roles are comparable, given that roles may well differ in other sectors such as the educational field (Penrod, Dolence, Douglas, 1990).

Data collection is limited to identification of CIO roles in relation to a set of nine leadership roles as identified by Gottschalk (2001). These leadership roles are associated with the position of the CIO. Three of the nine leadership roles originate from Mintzberg (1990) and the research he conducted on the role of managers. The other six originate from the Computer Sciences Corporation (1996) and its experience in the field of organizational consulting. This set of leadership roles has been utilized for key research surrounding the role of the CIO. For instance, Grover, Jeong, Kettinger and Lee (1993) applied Mintzberg's (1990) three managerial roles to their research on the role of CIO and in a 2004 field study, which examined the organizational roles of CIOs and IT leaders in seven fortune 500 companies, Weiss & Anderson (2004), two recognized experts in the IT management field, chose to use the complete set of nine leadership roles as the basis of their research.

This research does not distinguish between the position of Chief Information Officer (CIO) and Chief Technology Officer (CTO). Most literature refers to both positions interchangeably. Literature referring to organizations where both positions exist is part of this research and descriptions of CIO roles are taken into consideration for both the CIO and CTO.

The outcome of this study, a composite "responsibilities" section of the CIO job description is limited to the job responsibilities of the position of the CIO as they relate to leadership roles, in particular the leadership roles identified through the content analysis that form the foundation to this study. Ojimba (2004), a certified compensation professional, published an article on salary.com outlining the main sections of a job description (see Figure 8).

Only the “major responsibilities” (Ojimba, 2004) section of the job description is considered in the outcome of this study. Ojimba (2004) defines this section as “describing the job as it currently exists and including the *essential duties* of the job.

The research method of literature review is an approach that draws on others’ published ideas and research efforts. Furthermore conceptual content analysis (Palmquist, Busch, De Maret, Flynn, Kellum, Le, et al., 2005) requires the researcher to organize, peruse, classify and synthesize (Leedy & Ormrod, 2005) the data to achieve a meaningful outcome for the study’s identified audience.

Problem Area

In most organizations, no other position among senior executives is more inconsistently defined than the CIO’s (Thomas, 2000). This has led to intense scrutiny of the CIO position itself, and according to Rockart (2000), “predictions of its demise are rampant” (p.5). Hirschheim (2003) links the perception of the CIO within the organization to the overall perception of IT and states that “after nearly half a century, corporate IT is still considered an overhead” and “CIOs have not been able to change [that]” (p.8, par.3). However, Ulrich (2000) posits that if this position was eliminated or diminished, it is likely that company alignment between business and IT would not be properly addressed. Ulrich (2000) goes on to say that CIOs are in the unique position of being a leader “in developing a clear vision for IT and motivate executives and all employees to pursue this vision” (Ulrich, 2000, par. 4). Lee (2005) states that “significant IT-related opportunities have yet to be exploited” (p.2, par. 9) by CIOs.

King (2004), an award-winning business and technology journalist, sees the CIO’s role evolving into three vastly different functions; product innovator, entrepreneur and chief process

officer. As diverse as these roles may seem, King (2004) argues that they evolved from the same organizational need: “tying the responsibilities of the CIO directly to the bottom line” (King, 2004, p.2). CIOs are getting involved in their organizations as product innovators by, for example, “helping product engineers figure out how to best incorporate Internet-based intelligence and communications capabilities into their [products and services]” (King, 2004, p.1). Then, once the products or services are developed, the CIO’s role often shifts to entrepreneur. As entrepreneur, the CIO is directly involved with clients, negotiating contracts and brokering deals (King, 2004). As chief process officers, CIOs are getting directly involved in aligning business processes with IT. For example, chief process officers oversee implementations of “new financial systems with an eye toward reducing supply chain complexities and costs” (King, 2004, p.2).

While this categorization by King (2004) provides one way to view the evolution of the role of the CIO, based on a review of literature collected by this researcher, a clear definition of the position of the CIO appears unavailable. Thus, attempts to define the position of the CIO have rendered a variety of roles associated with the CIO (Gottschalk, 2001; Weiss & Anderson, 2004). Gottschalk (2001), a leading researcher in the field of IT management, combined three critical management attributes established by Mintzberg (1990) with six organizational development roles identified by the Computer Sciences Corporation (1996) to establish a set of roles that could describe the role of the CIO in 2001. The CIO roles presented by Gottschalk (2001), with brief annotations, are as follows:

Figure 1: The Gottschalk Set of CIO Leadership Roles

Leadership Role	Definition
Informational	<p>In this role the CIO acquires and manages information through his/her personal network or other information channels (<i>Monitor</i>). He/she evaluates the gathered information and then passes it on to co-workers (<i>Disseminator</i>). The CIO also provides information to executive management and external organization as a <i>spokesperson</i> (Mintzberg, 1990).</p>
Decisional	<p>This role encompasses activities from initiating enterprise-wide projects (<i>Entrepreneur</i>), to managing in crisis situations brought on by internal or external factors (<i>Disturbance Handler</i>), to being a <i>Resource Allocator</i> who coordinates inter-departmental processes and assigns staff hours, to corporate <i>Negotiator</i> who leads contract talks, manages grievances and promotes internal initiatives (Mintzberg, 1990).</p>
Interpersonal	<p>In this role the CIO represents the organization internally as <i>Leader</i>, who hires, coaches and motivates co-workers and externally as <i>Figurehead</i> to the organization and the outside world as well as <i>Liaison</i>, who maintains a network of colleagues and stakeholders outside the vertical chain of command (Mintzberg, 1990).</p>
Chief Architect	<p>This role primarily applies to the CIO as IT strategist. According to the CSC (1996), his/her “primary work (...) is to design and evolve the IT infrastructure so that it will expand the range of future possibilities for the business, not define specific business outcomes” (p.32).</p>

Leadership Role	Definition
Change Leader	In this role the CIO leads initiatives aimed at improving organizational processes and structure. The CIO, as stated by the CSC (1996), provides “new IT tools, but also puts in place teams of people who can redesign roles, jobs and workflow, who can change beliefs about the company and the work people do” (p.32).
Product Developer	In this role the CIO develops innovative strategies to support and improve the organization’s delivery of its product through IT. He/She conducts business experiments initiated through the IT department, which may or may not be adopted by the organization (CSC, 1996).
Technology Provocateur	As technology provocateur the CIO aligns IT with the organization’s business strategy. In this role, the CIO works directly with senior leaders from all departments to conduct company-wide initiatives aimed at improving business processes through the effective use of IT. The technology provocateur “understands both the business and IT at a deep enough level to integrate the two perspectives in discussions about the future course of business”, as CSC (1996) states (p.32).
Coach	As coach, the CSC (1996) writes, the CIO “teaches people to acquire the skill sets they will need for the future.” (p.32) It goes on to say that “coaches have two basic responsibilities: teaching people how to learn, so that they can become self-sufficient, and providing team leaders with staff able to the IT-related work of the business” (p.32).

Leadership Role	Definition
Chief Operating Strategist	The CIO as chief operating strategist works with the executive team to align organizational strategy with IT strategy. The CSC (1996) writes, that the most important, and least understood, parts of the role have to do with the interpretation of new technologies and the IT market place, and the bringing of this understanding into the development of the digital business strategy for the organization” (p.32).

The set of nine leadership roles, which encompasses leadership style and function, has been the foundation for key studies and surveys. For example, Grover, Jeong, Kettinger and Lee (1993) applied Mintzberg’s (1990) three managerial roles to their research on the role of CIO. The abstract of their 1993 study entitled “The Chief Information Officer: A Study of Managerial Roles” reads as follows:

“This study investigates the managerial roles of the chief information officer (CIO) based on Mintzberg’s classic managerial role model. Our findings indicate that CIOs differ from manufacturing and sales executives in the relative importance they place on managerial roles. This difference does not exist between CIOs and finance executives or between CIOs and information systems (IS) middle managers. As IS management matures, the spokesman and liaison role of the CIO becomes more important. Surprisingly, as IS matures, the strategic responsibilities entitled in the monitor and entrepreneur roles of the CIO do not become more important. However, it was found that the more centralized the IS resource, the greater the CIO’s role in acting as a spokesman, environmental

monitor, and resource allocator. The results of this study have implications for management development, training, and the career planning of IS management” (Grover, Jeong, Kettinger and Lee, 1993, p.109).

Weiss & Anderson (2004) used the set of nine leadership roles in its entirety in their field study entitled “CIOs and IT Professionals as Change Agents, Risk and Stakeholder Managers.” The following is that study’s abstract:

“This article examines the organizational roles of IT executives in seven Fortune 500 companies. Results show that many CIOs and IT leaders increasingly assume change and risk management roles. They must also orchestrate cultural and political interests of multiple stakeholders to succeed in implementing projects. CIOs and IT senior staff in large, global organizations experience pressures from internal and external clients to facilitate business problem solving as well as helping with technical solutions. These professionals are required to take on expanded roles, including assisting their clients meet market expectations and performance goals through the use of new technologies. Implications and lessons from our findings for effective IT project leadership are reported” (Weiss & Anderson, 2004, p.13).

However, the above referenced studies as well as the other collected literature do not provide a clear definition of the evolving role of the CIO. This study intends to identify and present common roles and responsibilities for the CIO in large organizations in the technology sector, as these have evolved during the Web-based era.

CHAPTER II – REVIEW OF REFERENCES

The review of references provides a detailed summary of articles, papers and studies identified as the key literature upon which this study is founded. A source qualifies as key literature when it provides fundamental information to the development of this research on the changing role of the CIO. The key literary resources are reviewed in alphabetical order. Each review contains a brief summary of the information contained in the reference and a description of how this information is used. It also includes the criteria used to determine the suitability of the reference.

Byrnes, Jonathan. (2005). "New CIO Role: Change Warrior." Harvard Business School Working Knowledge June 13, 2005. Retrieved on 01/10/06 from:
<<http://hbswk.hbs.edu/item.jhtml?id=4854&t=dispatch>>.

Byrnes' article provides insight into the relationship of technical background, business knowledge and leadership skills required for the current position of the CIO. Byrnes ties the evolution of corporate IT, which has moved from youth to maturity over the last decade, to fundamental changes in the corporate IT lifecycle due to increased demand for new IT from the business side. In this environment, the goal is to improve business processes with the effective implementation of IT. In contrast to earlier times, this requires a largely different skill set from IT leadership, the CIO. Byrnes uses the case of General Electric to declare that effective CIOs must have substantial knowledge of business processes and must get involved on all levels of the organization in order to be effective change leaders.

Byrnes' article is selected as one entry to the data set for use in the data analysis process, as he addresses several emerging CIO job responsibilities that relate to the Gottschalk (2001) set of CIO leadership roles.

Jonathan Byrnes earned a doctorate degree from Harvard Business School and now lectures at MIT. He owns a consulting firm focused on IT organizations.

Gottschalk, Petter. (2001). "The Changing Roles of IT Leaders." In: Papp, R (editor): *Strategic Information Technology: Opportunities for Competitive Advantage*, USA: IDEA Group Publishing, pp. 150-168.

Gottschalk's 2001 publication is the centrepiece for this study. His set of nine CIO leadership roles constitutes the foundation for research into the existing and emerging content categories utilized in the data collection and analysis process of this study. References to the set of nine leadership roles are contained in virtually every section of this study.

Gottschalk's work was selected for this study as it provides the most diverse and complete published set of leadership attributes relating to IT leaders and CIOs. It is a proven set of content categories as it is used by other researchers, including Weiss & Anderson (2004).

Dr. Gottschalk is Professor for Information Management at the Norwegian School of Management. He is teaching strategic knowledge management technology to undergraduate and graduate students in Norway and China. He is conducting knowledge management research in law firms in Norway and Australia. Professor Gottschalk earned his MBA at the Technical University Berlin, Germany, his Master of Sciences degrees at Dartmouth College and MIT, USA, and his Doctorate of Business Administration at Henley Management College,

Brunel University, UK. His executive experience includes CIO at ABB and CEO at ABB Datacables.

Grover, V., Jeong S., Kettinger, W., and Lee, C. (1993). "The Chief Information Officer: A Study of Managerial Roles." *Journal of Management Information Systems*, Fall 1993, Vol. 10, No.2, pp107 – 130.

This 1993 study of managerial roles relating to the Chief Information Officer provides helpful historical background to the research on the role of the CIO. Published in 1993. And while it lies outside the general timeframe pertinent to this study (1995 – 2005), Grover, et al. utilize Mintzberg's (1990) three managerial roles as a foundation to their research on the role of the CIO. Thus, the work is used to lend further credibility to the set of content categories used in this study. Mintzberg (1990) first defined the interpersonal, decisional and informational roles, which were later adopted by Gottschalk (2001) as part of the set of nine CIO leadership roles.

At the time of publication of their article in 1993, Grover and Kettinger were Assistant Professors at the College of Business Administration at the University of South Carolina and Jeong was a doctorate candidate in Management Information Systems. Lee was an Assistant Professor of MIS at the Perdue School of Business at Salisbury State University. Dr. Grover and Dr. Kettinger have numerous published papers in such journals as *Journal of Information Systems Management*, *Information and Management*, *Information Management Review* and many others.

King, Julia. (2004). "The Wide-Ranging CIO." *Computerworld*. 4/5/2004. Vol. 38 Issue 14. Retrieved on 3/22/06 via Academic Search Premier database.

King's article describes the expanding corporate roles of the CIO position based on examples of three CIOs in different large-size organizations. She finds that one is heavily involved with product innovation, while the other has become his organization's efficiency expert. The third CIO, meanwhile, sees his responsibilities expand to include not just all of IT but also the entire administrative functions in his organization, which King categorizes as entrepreneurial. However diverse these functions of the three CIOs seem, King is able to clearly identify one role that all of them have in common: *chief process officer*. According to King, every CIO must get involved in process implementation and design efforts as organizations are beginning to recognize how extensively a systematic process oriented organization "can be leveraged to gain efficiencies outside of pure technology" (p.6).

This article is quoted in the purpose and problem area section of this study. It is also selected as part of the data set used for data analysis.

Julia King is a business and technology journalist and founding editor of the *Computerworld ROI* magazine. According to the *Computerworld Premier 100* website, she has "earned several awards from the American Society of Business Press Editors and she is a frequent presenter and panel moderator at [IT] industry conferences" (par.26). This article published in *Computerworld* magazine has been cited by fellow journalists and academics in the IT field.

Palmquist, M., Busch, C., De Maret, P., Flynn, T., Kellum, R., Le, S., et al. (2006). *Content Analysis*. Writing@CSU. Colorado State University Department of English. Retrieved 4/22/06 from <<http://writing.colostate.edu/guides/research/content/>>.

The Colorado State University website contains a writing guide maintained by Palmquist et al. (2006) with step-by-step instructions on how to conduct a content analysis. This writing guide is cited extensively throughout this study as support to design and guide the conceptual content analysis. Particular attention is paid to application of the eight process steps as outlined in Chapter III - Method.

This website is selected because it provides a detailed methodology to content analysis strategy. Palmquist is a renowned scholar in the field of research writing and is recommended by University of Oregon AIM Program instructors.

Ross, J. and Feeny, D. (1999). "The Evolving Role of the CIO" Massachusetts Institute of Technology, August 1999.

Ross and Feeny's MIT working paper focuses heavily on the forces that have influenced the role of CIO during three distinct eras: mainframe, distributed and Web-based. Aside from valuable background information, this paper provides crucial framing criteria in regard to the Web-based era timeline (see Chapter I), and it is used as one entry in the data set for data collection (see Chapter IV) as it addresses various evolving roles of the CIO.

Both authors, as well as the working paper itself are cited frequently in other sources within the literature collection that discuss the role of the CIO specifically and the IT/IS field in

general. Specifically, Feeny's work is cited by Hirschheim et al. (2003), Weiss and Anderson (2004) as well as Gottschalk (2001).

Stephens, C., Mitra, A., Ford, F., and Ledbetter, W. (1995). "The CIO's Dilemma: Participating in Strategic Planning" *Information Strategy*, Spring 1995, Vol. 11, Issue 3, p13, 5p.

Stephens, et al. conducted a study observing five CIOs in different large-size organizations. Activities are logged and categorized into eight areas of responsibilities. Stephens, et al. conclude from the results that there is a strong organizational need for the CIO to participate more in strategic planning. This study is used as a literary resource for data analysis. Its published date lies within the specified timeframe of this study and is, therefore, eligible.

The authors, in particular Dr. Stephens, as well as the article itself are cited by Banker et al., Gottschalk, Hirschheim et al., Penrod et al., Ross & Feeny and Weiss & Anderson.

Weiss, J., & Anderson, D. (2004) "CIOs and IT Professionals as Change Agents, Risk and Stakeholder Managers: A Field Study" *Engineering Management Journal*, 16(2), 13-18. Retrieved Wednesday, March 22, 2006 from the Business Source Premier database.

Weiss & Anderson's field study examines the organizational roles of CIOs in several large organizations through the use of interviews. CIOs are interviewed regarding their organizational responsibilities. Weiss & Anderson utilize Gottschalk's set of leadership roles as a basis for categorizing their findings. This field study is a key reference, selected a part of the data set for data analysis since Weiss & Anderson are able to identify predominant leadership

roles among the interviewed CIOs. The abstract is provided in the Problem Area to underscore the context for the use of Gottschalk's (2002) nine leadership roles.

Both, Weiss and Anderson are academics, affiliated with Bentley College since 1992 and are IT industry consultants. Weiss specializes in leadership and team development as professor of management at Bentley College and Anderson is an IT manager for the Federal Reserve System. His experience includes working with large organizations on complex IT migration and integration strategies.

CHAPTER III - METHOD

Primary Research Method

The method of research utilized for this study is a literature review with an historical approach. Using an historical approach (Leedy & Ormrod, 2005) provides a time dimension to the research process such that an understanding emerges through “the meaning of these events, in terms of their relationships both to one another and to the problem under study” (p.169). This allows the data to be analyzed from an additional angle in that a chronology of the changing leadership roles of the position of CIO can be established spanning the Web-based era (Ross & Feeny, 1999). Conceptual content analysis (Palmquist, Busch, De Maret, Flynn, Kellum, Le, et al., 2005) is conducted using a priori and emergent content analysis strategies (Weber, 1990). The Gottschalk (2001) CIO leadership roles form the a priori set of categories. However, this set is treated interactively (Palmquist, Busch, De Maret, Flynn, Kellum, Le, et al., 2005), in that it allows the researcher to add additional leadership roles as they are identified during the data analysis process. This emergent content analysis strategy (Weber, 1990) is valuable to this study as it enables the researcher to build a comprehensive picture of the changing roles of the CIO.

Literature Collection

The collection of literature is focused on works that address one or more of the following topics.

1. The role of the CIO.
2. The role of executive teams.
3. The landscape of large technology organizations.
4. Leadership roles associated with CIOs or executive teams.

Since the intent of this study is to provide help in understanding the current role of CIO, the literature collected is limited to works published during the Web-based era (Ross & Feeny, 1999), which equates to the timeframe of 1995 to 2005. The study's audience is any executive team, including the CIO, in a large technology organization. Thus, the literature collected only addresses IT organizations with 500 employees or more (Taylor, 1995).

Other limitations to the collection of sources pertain to academic reliability. Initial review of the located literature indicated a lack of scholarly sources that address the contemporary role of the CIO. In fact, the topic is largely practical and focused specifically on the technology sector. Thus, sources selected for this study may not originate from the academic community, however, due to experience in the field of IT management, they can supply subject matter expertise. It is this researcher's opinion that such sources arguably supply more valuable perspective to this study than academic sources due to their close proximity to and experience with the IT management environment.

Literature collection is conducted primarily online by accessing library databases and the World Wide Web (WWW). The databases are accessed through the University of Oregon Online Library portal. The databases Business Source Premier and Academic Search Premier render most of the applicable material. The remaining sources are found through Internet searches using Google search engines, including Google Scholar.

A variety of key words pertaining to the topics listed above are used in the searches.

The list of key words is included in Figure 2.

Figure 2: Key Search Terms

<ul style="list-style-type: none"> • Chief Information Officer (CIO) • Executive Team • Chief Technology Officer (CTO) • Chief Executive Officer (CEO) • Change Management • Change Agent • IT management • Chief Operating Strategist 	<ul style="list-style-type: none"> • IT industry • Information Technology • Organizational Change • Management Structure • Organizational Hierarchy • Leadership Role • Interpersonal Role • Product Developer 	<ul style="list-style-type: none"> • Decisional Role • Informational Role • Chief Architect • Change Leader • Technology Architect • Coach • Technology Provocateur
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Searches are primarily conducted using combinations of keywords, such as 'CIO and Change Agent and IT industry'. The use of only single words for the searches renders unmanageable results sets that are too large for the purpose of this study, and furthermore, largely contain results that are not applicable to the topic or to the related subject areas.

Data Collection and Analysis

The search of the literature rendered 19 sources to be used as the data analysis set. The sources' publishing dates span the Web-based era, from 1995 to the present year, 2006. Two sources are published in the 1990's, one in 1995 and the other in 1999. Four sources are published in the year 2000 and two sources are published in the following year, 2001. Two

sources are published in 2002, two sources are from 2003 and another two sources are from 2004. Five sources are published in 2005.

The uneven distribution of publishing dates is noted. However, the content within the sources considered for data analysis is largely focused on industry developments involving the role of the CIO. Such developments are not tied to the publishing year but seem to usually span the previous three to five years. The distribution of publishing dates works in favor of this research since the goal of this study is to provide a vision of the current role of the CIO and almost half the sources are published within the last three years. The sources considered for data analysis are listed in Figure 3.

Figure 3: Sources for Data Analysis

Author	Title	Year Published
Byrnes	"New CIO Role: Change Warrior"	2005
CRM Today	"Leading CIOs stepping up to play change-agent role."	2005
Enns, H., Huff, S., and Golden, B.	"Chief Information Officers' Technical Backgrounds & Influence Behaviors: Competing Perspectives"	2001
Fisher, S.	"Changing of the guard: CIOs, CTOs in flux"	2000
Hirschheim, R., Porra, J. and Parks, M.	"The Evolution of the Corporate IT Function and the Role of the CIO at Texaco – How do Perceptions of IT's Performance Get Formed?"	2003
King, J.	"The Wide-Ranging CIO"	2004
LaMonica, M.	"Driving change"	2001
Lee, D.	"CIOs can thrive as pace of change quickens"	2005

Author	Title	Year Published
Lepore, Rockart, Earl, Thomas, McAteer and Elton	"Are CIOs Obsolete?"	2000
McBride, Siobhan	"CIOs must become leading 'change agents'"	2004
McClenahen J.	"CIOs soar to strategic role"	2002
Morgan, N., & Gary, L.	"Should You Fire Your CIO?"	2002
Passori, Al.	"The State of the (IT) Union: CIO to CEO"	2005
Penrod, J.	"Creating a Realistic IT Vision: The Roles and Responsibilities of a Chief Information Officer"	2003
Raths D.	"Agent of e-change"	2000
Ross, J. and Feeny, D.	"The Evolving Role of the CIO"	1999
Stephens, C., Mitra, A., Ford, F., and Ledbetter, W.	"The CIO's Dilemma: Participating in Strategic Planning"	1995
Ulrich, W.	"The CIO has a new role for a new era"	2000
Weiss, J., & Anderson, J.	"CIOs and IT Professionals as Change Agents, Risk and Stakeholder Managers: A Field Study"	2004

The strategy chosen for data analysis is conceptual content analysis as described by Palmquist, Busch, De Maret, Flynn, Kellum, Le, et al. (2005). Conceptual content analysis provides for the ability to establish the existence of concepts in a body of literature (Palmquist, Busch, De Maret, Flynn, Kellum, Le, et al., 2005). There are three interpretive aspects that are considered during the data analysis process: (1) the text is manually coded for existence for any a priori categories (Weber, 1990); (2) while coding for the a priori categories, the researcher identifies any emergent content categories (Weber, 1990); and (3) any text related to job

responsibilities associated with any a priori or emergent content categories is captured. This approach provides the ability to gain as much information as possible during the data analysis process and include relevant contextual information as it relates to the CIO leadership roles. This minimizes the risk of dismissing vital information in regard to the changing role of the CIO. The strategy presents a series of eight interrelated steps, which are described below, as applied to this study.

Step 1: Level of Analysis. The text is coded for phrases (including full definitions), which form an a priori set of coding categories.

Step 2: Number of Concepts to Code for. The text is coded for the a priori set of nine CIO leadership roles based on the set of nine CIO leadership roles provided by Gottschalk (2001). The nine roles are simplified for coding purposes as follows:

- Informational Role
- Decisional Role
- Interpersonal Role
- Chief Architect
- Change Leader
- Coach
- Technology Provocateur
- Chief Operating Strategist
- Product Developer

Specific application of these roles while coding is supported by a detailed set of definitions. In addition, the initial set of nine is applied interactively, as a way to identify related content categories as they emerge from the literature.

Step 3: Code for Existence or Frequency of a Concept. Each source is coded for existence of any phrases associated with the a priori set of nine CIO roles (reviewed against related definitions) or any emergent categories.

Step 4: Level of Generalization. Phrases with same meanings are coded similarly and captured during the content analysis process. For example, if the phrase “Change Agent” is deemed to have the same meaning as “Change Leader”, a concept which is part of the a priori set, then the phrase “Change Agent is coded as “Change Leader” and captured as a synonym. Synonyms are listed in Table 1 (Figure 3).

Step 5: Translation Rules. Once a synonym is identified for a particular concept, it is noted so that it cannot also be a synonym of a different concept since phrases with same meanings are coded similarly.

Step 6: Irrelevant Information. There can potentially be numerous ways to describe the role of the CIO. However, concepts utilized in this study must be identified either directly with the priori set for coding or be related closely to the set. Any other interpretation of a CIO role is considered irrelevant, and not captured. In addition, categories relating to other executives, such as the CEO, are not captured.

Step 7: Coding Process. The data collection process consists of coding the selected sources for a priori and emergent content categories. This process is conducted manually in its entirety. The phrases in the text that refer to any of the nine CIO leadership roles directly or by identified synonym (see Table 2) are highlighted. Any related job responsibilities (see Table 3) are also highlighted in a different color. The existence of each CIO leadership role and any associated job responsibilities are noted on a 3x5 card for each coded document.

Data Presentation

Step 8: Analyze Results. Results of the data analysis are transferred from the 3x5 cards, and are populated into tables. The first table (see template in Figure 4) contains the CIO leadership roles as content categories and their associated synonyms that were captured during the coding process. It also displays the source and publication date.

Figure 4: Table 1 Template – CIO Leadership Roles and Synonyms

Year Published	Source	Leadership Role(s)	Synonym(s)
1995	Byrnes	Change Leader	Change Agent

The second table (see template in Figure 5) provides a summary of Table 1 by displaying the frequency of each content category in the entire body of the identified literature. This data set is sorted ascending by year of source published to align with the focus of this study, which is to define the *changing* role of the position of the CIO, in comparison to previous iterations.

Figure 5: Table 2 Template – CIO Leadership Roles – Frequency by Year

Year Published	CIO Leadership Role	Number of Occurrences
1995	Change Leader	TBD
1995	Chief Architect	TBD
1995	Chief Operating Strategist	TBD
1995	etc	

Year Published	CIO Leadership Role	Number of Occurrences
1996	Change Leader	TBD
1996	Chief Architect	TBD
1996	Chief Operating Strategist	TBD
1996	etc	
1997	Change Leader	TBD
1997	Chief Architect	TBD
1997	Chief Operating Strategist	TBD
1997	etc	
1998	etc	

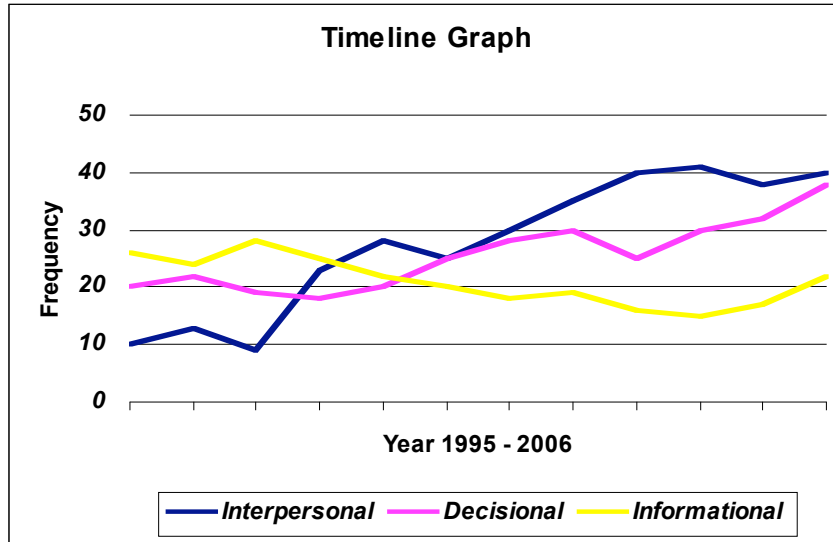
The third table (see template in Figure 6) provides a listing of all job responsibilities associated with each CIO leadership role. Data in Table 3 is intended to report responsibilities to associate with CIO roles aligned with the a priori and emergent content categories. This table is then utilized to build the composite “responsibilities” section of the CIO job description (see Table 4), as part of the final outcome of the study. Table 4 is presented and discussed in the Conclusions chapter of this paper.

Figure 6: Table 3 Template – Job Responsibilities Aligned to CIO Roles

CIO Leadership Role	Job Responsibilities	Source(s)
Change Leader	Project Management Team Coaching	Byrnes, 1995

Materials produced for the outcome of this study are presented in two final tables (see Tables 4 and 5) and include the composite “responsibilities” section of the CIO job description (Ojimba, 2004) (see Table 4), supported by a timeline graph (Corda, 2004) (see Table 5). The timeline graph is a visual display of the changing leadership roles of the CIO during the Web-based era (Ross & Feeny, 1999) (see template in Figure 4). Each CIO leadership role is represented by its own line on the graph. Each line represents the variance of a particular leadership role over the course of the last eleven years within the technology sector. The graph provides key historical context on the changing role of the CIO and can be used as a learning tool to educate others on the unique evolution of the CIO role.

Figure 7: Timeline Graph Template (with Sample Data)



The composite “responsibilities” section of a job description for the position of the CIO within large technology organizations is presented in the format of a standard job description, as defined by Ojimba (2004) (see Figure 8). This job description contains content within the “responsibilities” section only. No attempt is made to provide content for any of the other sections such as “job qualifications” (Ojimba, 2004). The research conducted for this study is entirely focused on the role of the CIO and can, therefore, only pertain to the “responsibilities” section of the CIO job description. Ojimba (2004) defines this section as “describing the job as it currently exists and including the *essential duties* of the job. These are tasks for which the employee is evaluated. A task is considered essential if the job exists in order to perform the function. There are a limited number of people who can perform the duties of a job, and failure to do so can adversely effect the organization. A good way to determine responsibilities is to estimate the number of hours spent in performing a function within a 40-hour week. The figures should be in percentages that make a sum of 100 percent” (par.10).

Figure 8: CIO Job Description – Structure by Ojimba (2004)

- Job Title
- Location
- Fair Labor Standards Acts (FLSA) status
(exempt/non-exempt)
- Position Summary
- **Major Responsibilities**
- Job Qualifications
- Working Condition

CHAPTER IV – ANALYSIS OF DATA

As described in the data analysis section of Chapter III, the first part of the coding process is aimed at tallying and quantifying the existence of CIO leadership roles within the selected literature. Nineteen sources are coded for the a priori set and any emergent CIO leadership roles. The areas within the text are highlighted where a direct reference to a CIO leadership role or related phrase is found, as described in Chapter III, step 2 of the coding process. The results are transferred into Table 1, including source and year published. The goal is to document each leadership role referenced within each source, whether it is part of the a priori set or an emergent category.

Results of this first stage of data analysis show that all nine CIO leadership roles part of the a priori set are represent in the selected literature. In addition, the CIO leadership role of Chief Innovation Officer (McBride, 2004; Fisher, 2000) is identified as an emergent category. This emergent role is a functional attribute and can be linked to the Computer Sciences Corporation (1996) set of six CIO leadership roles that is associated with leadership activities, as described in Chapter I – Full Purpose.

Table 1: CIO Leadership Roles and Synonyms

Year Published	Source	Leadership Role(s)	Synonym(s)
2005	Byrnes, J.	Decisional Role	“ Shape the vision with the senior executives, marshalling all the resources necessary”
		Informational Role	“ Armed with this knowledge , the CIO can partner...”

Year Published	Source	Leadership Role(s)	Synonym(s)
		Chief Architect	Creator of IT opportunities
		Change Leader	Change Agent
		Coach	Training
		Technology Provocateur	Technologist
		Chief Operating Strategist	Senior/Operating Management
2005	CRM Today	Interpersonal	“Collaborative relationships with their business peers”
		Decisional	“Make hard decisions”
		Change Leader	Enterprise Change Agents
2001	Enns, H., Huff, S., and Golden, B.	Interpersonal	Build relationships with other executives (p.19)
		Chief Operating Strategist	Strategic Initiative (p.12)
2000	Fisher, Susan	Interpersonal	“Relationships with outsourcing partners to worldwide operations (p.3)”
		Chief Architect	IT Strategist
		Chief Operating Strategist	Corporate Strategist/Operations Manager

Year Published	Source	Leadership Role(s)	Synonym(s)
		Chief Innovation Officer	Innovation
2003	Hirschheim, R., Porra, J. and Parks, M.	Informational	Communicate the value of IT (p.20)
		Chief Architect	Systems Integration (p.20)
2004	King, J.	Decisional	Negotiator (p.2)/ Entrepreneur (p.3)
		Interpersonal	Collaboration with customers (p.3)
		Change Leader	Change Agent (p.3)
		Product Developer	Product Development (p.3)
		Chief Operating Strategist	Involvement in merger and acquisition (p.3)
2001	LaMonica, M.	Interpersonal	"Pick the right people that understand IT and business (p.55)"
		Change Leader	Change Agent
		Technology Provocateur	"Devise a matrix management structure... (p.54)"
		Chief Operating Strategist	"Big Picture" Strategist (p.54) "Aligning IT with the business" (p.54)
2005	Lee, D.	Decisional	Entrepreneur (p.3)
		Chief Architect	Technology Architect (p.2)

Year Published	Source	Leadership Role(s)	Synonym(s)
		Change Leader	Change Warrior (p.2)
2000	Lepore, Rockart, Earl, Thomas, McAteer and Elton	Decisional	Marketing and Financial decisions (p.4)
		Interpersonal	Build relationships inside and outside the company (p.4)
		Change Leader	Change master (p.6)
		Chief Operating Strategist	Influence on company's strategic direction , organizational structure, and culture (p.4)
2004	McBride, S.	Change Leader	Change Agent
		Chief Operating Strategist	Contribution to Business Strategy/Communicate with top executives
		Chief Innovation Officer	
2002	McClenahan, J.	Interpersonal	"Presentations to [...] analysts"/"advisor to [other corporation] board of directors (p.28)"
		Decisional	

Year Published	Source	Leadership Role(s)	Synonym(s)
		Change Leader	“Implementation of systems (p.28)” / “CIO primary role is to assure that technology is being used in the most effective fashion (p.28)”
		Chief Operating Strategist	“ Strategic Planning (p.27)” / “Partner in setting strategy (p.30)”
		Product Developer (p.27)	
2002	Morgan & Gary	Informational	Knowledge Broker (p.9)
		Decisional	Negotiator (p.9)
		Interpersonal	Relationship Manager (p.9)
2005	Passori, A.	Change Leader	“ Create organizational processes, structures, and competencies that support agility (p.1)”
		Chief Operating Strategist	“ Align IT resources with LOB needs (p.1)”
2003	Penrod, J.	Change Leader	Align the influence systems of organizational culture, structure, system architecture, [...] (p.5)

Year Published	Source	Leadership Role(s)	Synonym(s)
		Chief Operating Strategist	Full member of the executive management team (p.3)
2000	Raths D.	Interpersonal	Aggressive hiring and retraining program (p.48)
		Decisional	Architectural and product decisions (p.48)
		Chief Operating Strategist	Head of strategy and business development (p.47) / Strategic Planning (p.47)
1999	Ross, J. and Feeny, D.	Informational	Chief Knowledge Officer (p.13)
		Interpersonal	Networker (p.13)
		Chief Architect	Technology architect (p.14)
		Technology Provocateur	Technology advisor (p.14)
		Chief Operating Strategist	CIO takes increasing responsibility for defining an organization's strategic future (p.13)
1995	Stephens, C., Mitra, A., Ford, F., and	Interpersonal	Interact more with those outside the information technology area (p.4)

Year Published	Source	Leadership Role(s)	Synonym(s)
	Ledbetter, W.	Chief Operating Strategist	Linking information technology to business strategy (p.1)
2000	Ulrich, W.	Interpersonal	Influence and inspire internal and external business units (p.1)
		Change Leader	Leader in developing a clearer vision (p.1)
		Technology Provocateur	Enable key business initiatives through [...] use of technology (p.1)
2004	Weiss & Anderson	Chief Operating Strategist	Business Strategist (p.14)

In accordance with the historical research approach, the results of Table 2 are used to calculate the number of occurrences of each CIO leadership role for each year, from 1995 to 2005. No data is available within the selected literature published from 1996 through 1998. All other years, 1995 and 1999 through 2006 are represented and several references to CIO leadership roles are located within each year.

Table 2: Leadership Roles – Frequency by Year

Year Published	Leadership Role	Number of Occurrences
1995	Interpersonal	1
1995	Chief Operating Strategist	1
1999	Informational	1
1999	Interpersonal	1
1999	Chief Architect	1
1999	Technology Provocateur	1
1999	Chief Operating Strategist	1
2000	Decisional	2
2000	Interpersonal	4
2000	Chief Architect	2
2000	Change Leader	2
2000	Technology Provocateur	1
2000	Chief Operating Strategist	3
2000	Chief Innovation Officer	1
2001	Interpersonal	2
2001	Change Leader	1
2001	Technology Provocateur	1
2001	Chief Operating Strategist	2
2002	Informational	1

Year Published	Leadership Role	Number of Occurrences
2002	Decisional	2
2002	Interpersonal	2
2002	Change Leader	1
2002	Chief Operating Strategist	1
2002	Product Developer	1
2003	Informational	1
2003	Chief Architect	1
2003	Change Leader	1
2003	Chief Operating Strategist	1
2004	Decisional	1
2004	Interpersonal	1
2004	Change Leader	2
2004	Chief Operating Strategist	3
2004	Product Developer	1
2004	Chief Innovation Officer	1
2005	Informational	1
2005	Decisional	3
2005	Interpersonal	1
2005	Chief Architect	2
2005	Change Leader	4

Year Published	Leadership Role	Number of Occurrences
2005	Coach	1
2005	Technology Provocateur	1
2005	Chief Operating Strategist	2

Table 2a is directly related to Table 2. In order to achieve more perspective of the results presented in Table 2, the total number of occurrences of each CIO leadership role are calculated regardless of the publishing year. Thus, all ten identified CIO leadership roles can be ranked from most to least referenced within the selected literature.

Table 2a: CIO Leadership Roles – Total Frequency

CIO Leadership Role	Total Number of Occurrences
Chief Operating Strategist	14
Interpersonal	12
Change Leader	11
Decisional	8
Chief Architect	6
Informational	4
Technology Provocateur	4
Chief Innovation Officer	2

CIO Leadership Role	Total Number of Occurrences
Product Developer	2
Coach	1

Table 3 presents related job responsibilities, as these are identified with any of the ten CIO leadership roles along with the associated source. Job responsibilities are identified for each leadership role including the emergent role of Chief Innovation Officer. It is especially noteworthy that a large number of job responsibilities located within the selected literature are associated with the most predominant CIO leadership roles: Chief Operating Strategist, Interpersonal, Change Leader and Decisional.

Table 3: Job Responsibilities Aligned to CIO Roles

Leadership Role	Job Responsibilities	Source(s)
Interpersonal	Partner with counterpart business leaders	Byrnes, J. (2005)
	Hire business-savvy IT executives (p.55)	LaMonica, M. (2001)
	Build relationships inside and outside the company (p.4)	Lepore, Rockart, Earl, Thomas, McAteer and Elton (2000)
	Talk with customers to see what some of their needs are (p.30)	McClenahen, J. (2002)

Leadership Role	Job Responsibilities	Source(s)
	Develop alliances with key vendors	Ross, J and Feeny, D. (1999)
Informational	Collaborate effectively in an environment with different legacy systems and newer generation technology (p.9)	Morgan & Gary (2002)
Decisional	<ul style="list-style-type: none"> • Negotiate contracts and “deal-making” with clients (p.2) • Be involved with sales effort when product offerings include software systems (p.4) 	King, J. (2004)
Chief Architect	Integrate incompatible systems (p.20)	Hirschheim, R., Porra, J. and Parks, M. (2003)

Leadership Role	Job Responsibilities	Source(s)
<p>Change Leader</p>	<ul style="list-style-type: none"> • Project Management • Process Improvement/Six Sigma • Redefine Business • Develop a set of strategic IT plans that span both system deployment and business change management • Operating Management • Senior Management • Business Change Management • Software Deployment 	<p>Byrnes, J. (2005)</p>
	<ul style="list-style-type: none"> • Integrate seamlessly the key components of business transformation: Technology, Processes and People. • Risk assessment • Process Improvement 	<p>CRM Today (2005)</p>

Leadership Role	Job Responsibilities	Source(s)
	<ul style="list-style-type: none"> • Change Management • Evaluate and improve the entire business operating model 	McBride, S. (2004)
	<ul style="list-style-type: none"> • Establish a matrix management structure (p.55) • Rely heavily on business-defined metrics (p.55) 	LaMonica, M. (2001)
	<ul style="list-style-type: none"> • Improve business processes/efficiencies (p.2) • Improve relations with the business by adopting [better] method of communicating with the business, end-customers, suppliers and all who need to know (p.2) 	Lee, D. (2005)
Change Leader	Sell management on the need to transform the IT organization	Ulrich, W. (2000)
Coach	Training	Byrnes, J. (2005)
Technology Provocateur	"Align IT with the business (p.54)"	LaMonica, M. (2001)
	Scan technologies (p.14)	Ross, J and Feeny, D. (1999)

Leadership Role	Job Responsibilities	Source(s)
		(1999)
Chief Operating Strategist	<ul style="list-style-type: none"> • Reinvent business processes with the Internet (p.55) • Architect integrated, standardized IT systems with heavy reliance on outsourcing (p.55) • Spearhead corporate cultural change by getting top management buy-in on IT innovations. 	LaMonica, M. (2001)
	<ul style="list-style-type: none"> • Be involved in areas such as marketing, sales, mergers and acquisitions and partnerships (p.30) • Oversee “everything happening throughout the supply chain ... at the transaction level (p.30).” 	McClenahan, J. (2002)
	Implement an aggressive hiring and retraining program (p.48)	Raths, D. (2000)
	Understand and communicate the financial picture of the IT investment portfolio to the CEO and line-of-business (LOB) executives (p.1)	Passori, A. (2005)

Leadership Role	Job Responsibilities	Source(s)
	Participate in strategic planning (p.1)	Stephens, C., Mitra, A., Ford, F., and Ledbetter, W. (1995)
	Work with a comprehensive cross section of business and IT representatives to develop a vision for the new IT organization (p.2)	Ulrich, W. (2000)
	Understand [...] organization's strategies and plans (p.17)	Weiss & Anderson (2004)
Product Developer	Participate in product development meetings (p.3)	King, J. (2004)
Chief Innovation Officer	Find ideas "on the edge" to bring into the business	McBride, Siobhan (2004)

CHAPTER V – CONCLUSIONS

As indicated in Table 2: CIO Leadership Roles – Frequency by Year, all nine CIO leadership roles (Gottschalk, 2001), part of the a priori set, are represented in the selected literature. Additionally, the CIO leadership role of Chief Innovation Officer (McBride, 2004; Fisher, 2000) is identified as an emergent content category within the data set. As indicated in Table 2a: CIO Leadership Roles – Total Frequency, four CIO leadership roles are predominantly represented within the data set as compared to the other six. They are Chief Operating Strategist, Interpersonal, Change Leader and Decisional. Considering the historical approach of this study, it is noted that these four CIO leadership roles are not only the roles that are most often mentioned within the literature, but they are also the four major evolving roles associated with the position of CIO over the last few years as the below timeline graph (Corda, 2004) indicates. The timeline graph also reveals that the other six CIO leadership roles remain consistently present in the literature throughout the Web-based era.

As described in Chapter I – Full Purpose, the a priori set of CIO leadership roles is split into two distinct groups; the Mintzberg (1990) set is associated with leadership style, the CSC (1996) set is associated with leadership activities. Two of the predominant CIO leadership roles determined by this study, Chief Operating Strategist and Change Leader, are part of the set formed by the CSC (1996) and the predominant leadership styles, Interpersonal and Decisional, are part of the Mintzberg (1990) set. However, the results of this study show a clear trend that the CIO leadership style is shifting from Interpersonal, which was predominant approximately in the year 2000, to Decisional in the year 2005. This finding may be directly related to the predominant CIO leadership activities of Chief Operating Strategist and Change Leader. In both roles the CIO takes on a decidedly more influential role in the organization, as suggested by the

related job responsibilities. Thus, it is not surprising that the CIO leadership style is shifting to be more decisional.

Figure 9: Timeline Graph

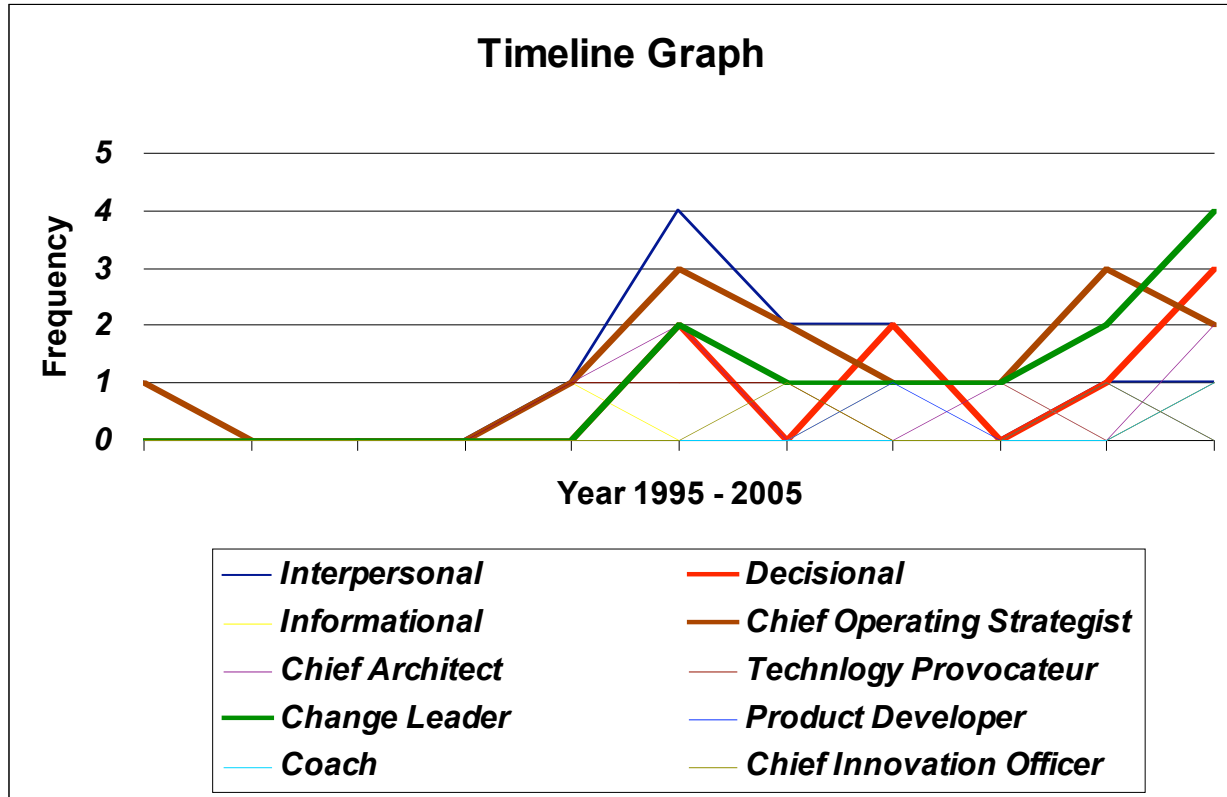


Table 3: Job Responsibilities Aligned to CIO Roles presents the key job responsibilities, as they relate to specific CIO leadership roles, identified within the selected literature. The results listed in Table 3 are used to form a composite “major responsibilities” section of a job description (Ojimba, 2004) for the current position of CIO. The “major responsibilities” are divided into four essential areas of competency: Strategic Management & Leadership, Operations Management, General Management and Hiring.

The bullet points listed for each area of competency are taken from Table 3: Job Responsibilities Aligned to CIO Roles, and are, in part, edited to form distinct descriptions of job responsibilities. This composite “Major Responsibilities” section of a job description for the position of the CIO is intended to help executive teams make educated decisions in better aligning CIO job responsibilities with their current organizational needs.

Figure 10: CIO Job Description – Major Responsibilities

Chief Information Officer (CIO) Major Job Responsibilities
<p>Competency #1 - Strategic Management & Leadership</p> <ul style="list-style-type: none"> • Understand the organization’s strategies and plans and participate in strategic planning. • Spearhead corporate cultural change by getting top management buy-in on IT innovations. • Develop a set of strategic IT plans that span both system deployment and business change management. • Work with a comprehensive cross section of business and IT representatives to develop a vision for the new IT organization. • Evaluate and improve the entire business operating model. • Understand and communicate the financial picture of the IT investment portfolio to the CEO and line-of-business (LOB) executives. • Improve relations with the business by adopting [better] methods of communicating with the business, end-customers, suppliers and others.
<p>Competency #2 - Operations Management</p> <ul style="list-style-type: none"> • Collaborate effectively in an environment with different legacy systems and newer generation technology • Scan technologies and identify innovative, new ideas/technologies to bring into the business. • Architect integrated, standardized IT systems with heavy reliance on outsourcing.
<p>Competency #3 - General Management</p> <ul style="list-style-type: none"> • Establish a matrix management structure. • Oversee all processes throughout the supply chain, at the transaction level. • Be involved in areas such as marketing, sales, mergers and acquisitions and partnerships. • Participate in product development meetings.
<p>Competency #4 - Hiring</p> <ul style="list-style-type: none"> • Implement an aggressive hiring and retraining program. • Hire business-savvy IT executives.

APPENDIX A - DEFINITIONS

Term	Definition
Chief Information Officer (CIO)	A senior executive of an organization who is responsible for information policy, management, control and standards (Penrod, Dolence, Douglas, 1990)
Chief Technology Officer (CTO)	Chief Technical Officer or Chief Technology Officer, usually seen as CTO, is a business executive position whose holder is focused on technical issues in a company. It emerged in the United States in the 1980s as a business-focused extension of the position of Director of R&D. Large research-oriented companies like General Electric, AT&T, and ALCOA created this position to increase the profits yielded from research projects in their laboratories. en.wikipedia.org/wiki/Chief_Technology_Officer
Content Analysis	“A research tool used to determine the presence of certain words or concepts within texts or sets of texts. Researchers quantify and analyze the presence, meanings and relationships of such words and concepts, then make inferences about the messages within the texts, the writer(s), the audience, and even the culture and time of which these are a part. Texts can be defined broadly as books, book chapters, essays, interviews, discussions, newspaper headlines and articles, historical documents, speeches, conversations, advertising, theater, informal conversation, or really any occurrence of communicative language.” (Palmquist, 2004)
For-Profit Technology Sector	Commercial Organizations producing electronic or digital products and systems considered as a group. From: http://www.answers.com/technology&r=67
Job description	A summary of the primary responsibilities of a job. Job descriptions play a critical role in determining the market value of a job. From: http://www.salary.com/aboutus/layoutscritps/
Job responsibility	Ojimba (2004) defines responsibility as “describing the job as it currently exists and including the essential duties of the job. These are tasks for which the employee is evaluated.”

Term	Definition
Large-size organization	A company with 500+ employees (Taylor, 1995)
Literature Review	“A literature review surveys scholarly articles, books and other sources (e.g. dissertations, conference proceedings) relevant to a particular issue, area of research, or theory, providing a description, summary, and critical evaluation of each work. The purpose is to offer an overview of significant literature published on a topic.” (Lyons, 2005) From: http://library.ucsc.edu/ref/howto/literaturereview.html
Organizational Strategy	“An organization's strategy deals with how to make management's strategic vision for the company a reality-it represents the game plan for moving the company into an attractive business position and building a sustainable competitive advantage.” From highered.mcgraw-hill.com/sites/0072443715/student_view0/glossary.html
Time-Line Graph	Time Line graphs are used to determine trends and cyclic variation based on interaction of data elements over time. The data is plotted on the graph and connected with lines. Line graphs can display large amounts of data that varies with time. From: http://www.corda.com/examples/graph_styles/time_line.cfm
Web-based Era	Time span of 1995 to present time. During this era organizations are operating with a strong emphasis on the use of the Internet and web protocols (Ross & Feeny, 1999).

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