


# Addis Ababa University
# College of Natural Sciences
# Department of Information Science

## The Changing Role of IS Managers in the Business Environment: Ethiopian context

By: Gezahegn Feyssa

Advissor: Tibebe Beshah(PhD)

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# The Changing Role of IS Managers in the Business Environment: Ethiopian context

By

Gezahegn Feyssa

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College of Science
Department of Information Science

This is to certify that the thesis prepared by Gezahegn Feyssa, entitled: *The Changing Role of IS Managers in the Business Environment: Ethiopian Context* and submitted in partial fulfillment of the requirements for the Degree of Master of Science (Information Science) complies with the regulations of the University and meets the accepted standards with respect to originality and quality.

Signed by the Examining Committee:

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Advisor: _____Signature _____ Date _____

## Dedication

***This work is dedicated to my Wife, W/o Kiddist Admassu***

***and***

***Our kids, Ruth and Ananya Gezahegn***

***Who are with me in every moment of my life!***

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*"Thanks be unto God for his unspeakable gift." 2 Corinthians 9:15*

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## Abstract

The advancement of IT functionalities together with the competition in this digital economy requires organizations to work strategically. The organizations strategy should go in line with the IT strategy and the business strategy so that the organization can meet the intended objective at the end of the day. The chief information officer (CIO) plays key role for the alignment of the business/IT strategy to have a highly competent business organization in this information age.

As the technology gets improved and organizations are becoming dependent on the IT services and functions, the complex IT management requires an executive level leader that is the CIO. The CIOs are multidimensional technology leaders that can influence the business of the organizations positively. Various literatures also indicate the changing role of the CIO's with the advancement in technology. Knowing the benefit and variation of the role and giving appropriate recognition makes organizations highly beneficiary. Although this issue has been investigated in developed nations from their context, there is no any empirical attempt especially in Ethiopian context. Hence, this study intends to investigate the changing role of CIOs in the business in this highly competitive technology era.

A survey study was employed to investigate the changing role of CIO's in some selected organizations in Ethiopia. Questionnaire and interview were the main data collection methods used.

Even though information technology (IT) is expected to lead the business as seen in the developed nations, it looks impractical in Ethiopian context. The result shows that the variations among organizations IT service maturity level determines the level of the CIO's role. CIO's of organizations which are at a lower level of service maturity focus on the routine tasks while other few are actively involving in the organizations strategic work. CIOs involvement in the strategic development will benefit both the CIO themselves and organizations in aligning the IT/Business strategy to be competent in this dynamic environment. It is also noted that even though the trend shows CIOs role is changing, the contribution of CIOs in aligning IT/business strategy and maximizing the performance of business is not substantial.

The research sample was limited to certain organizations that the researcher selected purposefully. This is due to shortage of getting documentation about organizations IT service maturity and CIOs related information. The result of this study might be affected by sample size, the experience and understanding of team leaders. Future work can be done on larger sample size consisting of only CIOs from organizations having similar IT service maturity and IT competence.

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# List of Acronyms

| | |
|---|---|
| IS | Information Systems |
| IT | Information Technology |
| CIO | Chief Information Officer |
| CIOs | Chief Information Officers |
| ICT | Information Communication Technology |
| CEO | Chief Executive Officer(s) |
| CFO | Chief Finance Officer(s) |
| C-Level | Chief Level |
| CISR | Center for Information Security Research |
| EA | Enterprise Architecture |
| SPSS | Statistical Package for Social Science |
| TMT | Top Management Team |
| MCIT | Ministry of Communication and Information Technology |
| ICTDA | Information Communication Technology Development Agency |
| ISM | Information System Management |

# Chapter One
# Introduction

## 1.1. Background

Information Technology (IT) has been regarded as enabler for business to be successful. Now a day IT becomes one of the core aspects for the business to sustain in this competitive world. The pervasive nature of Information Technology (IT) in today's organizations coupled with increased pressure to leverage technology assets has dramatically increased the importance of strategic information systems planning (Bechor,Neuman, Zviran and Glezer, 2009) as cited in [1].Hence IT Managers should be part and parcel of the organizations strategic plan development.

IS/IT Manager / CIO, used interchangeably, refers the highest level of the administration unit of the information technology department who is in charge of all information and communication technology of an organization. The loose definition of CIO as discussed in [2], used interchangeably with different titles like Information Technology(IT) Director, Vice president of IS, Director of Information resources, and Director of IS to indicate "a senior executive responsible for establishing policy and controlling information resources". Even though it is defined by different scholars differently, this study used " CIO as the highest-ranking IS executive who typically exhibits managerial roles requiring effective communication with top management, abroad corporate perspective in managing information resources, influence on organizational strategy, and responsibility for the planning of IT to cope with a firm's competitive environment. [2] "

Among the pillars of "the information systems strategy triangle" by (Pearlson and Saunders, 2010) as cited in [1] information strategy that is primarily the responsibility of the IS Manager (CIO) should "involve the consequences, intended or not, with in the business and the organizational strategies".

To plan and act in this agile world, planning the business and IS is the crucial step for the management. The IT experts have to see the in and the out of the business world and contribute on the short and long plan of the organization to make it competent enough for the objective it stands for.

A research in [3] pointed out the major issues for companies as they "pass through the 'window' of technological discontinuity" is effective management of the transition from the Data processing technology to the user-driven technologies. IT is a factor in the transition that makes the Chief Information Officers (CIOs) focus on an "out ward business strategy perspective" development.

The CIO position according to Pearlson and Saunders (2010) as cited in [1] becomes eminent in the late 1980's when 'technology grew from an expensive necessity to a strategic enabler'. The rapid technology change makes the Information systems planning more complicated that demand the effort of the CIO. Reed, (2001) as cited in [1] emphasized this saying:

> *'Strategic information and technology planning differs from planning that primarily focuses on user demand and financial justification. ...Strategic information systems and technology planning reflects a convergence of means and ends. As means, information systems and technology have become so important to achieving objectives, they must be weighed as part of the process of selecting objectives, not merely as a means to accomplishing objectives already identified'.*

A research in [4], suggests that the emerging role for the CIO to have critical roles not only understanding the technology but also a general –business oriented management skill with the considerable political, organizational and communication skills is must in the organization. This shows the CIO needs to have an all rounded skill and knowledge to perform the functions expected from the role.

A Study in [5] has identified ten managerial roles. Among the ten roles, a research in [2] has proposed six of the more valid within the context of IS management.

- Leader: a one who is in charge of motivating of subordinates and for staffing and training. example: making that most activities involve subordinates
- Liaison: creates his/her web of external relationships. Example: Attending conferences and creating opportunities for the organization to share experiences.
- Monitor: Seeks and receives information to understand the Organization and the environment. Example: reading periodicals and reports to get current information.
- Spokesman: involves the communication and information ideas. Examples: speaking to the board of directors and top management.

- Entrepreneur: Acts as initiator and designer of much of the controlled change in his/her organization. Example: developing an improvement project.
- Resource allocator: Responsible for allocation of human, financial, material, and other resources. Examples: working on budget; deploying staff.

These IS managers roles as discussed in [2] are grouped based on the decision locations, communication and information flows as the leader and resource allocator internal to IS and the rest four roles (Spokesman, Entrepreneur, Liaison and Monitor) as interaction between the intra and inter-organizational environments as can be seen in Figure2.

Factors affecting the role of IS Managers according to [5] are understanding of the differences in the managerial roles based on the functional areas, the time allocation for most appropriate role and hierarchical level. IS managers usually seen engaged in some routine activities and forget their priority task. The CIO should concentrate on the long term strategy and planning by leaving the day to day operations for the subordinates.

IS managers are also seen usually concentrating on the technical aspect of the technology in the establishing or upgrading of datacenters, infrastructures, services and handling the day to day routine support tasks. In [2] it is argued that the CIO should view IT as a means to enhance organizational effectiveness rather than as an end itself.
The IS services maturity and degree of centralization in the organization according to [2] affects the importance of the CIO role. The higher the services matured and the more services centralized the higher for role of the CIO in the organization to function.

IS maturity as defined in [2] is the formalization level of IS control mechanisms, level of user awareness and involvement, availability of strategic IS planning, and degree to which the setting of IS objectives is rational and compatible with organizational objective.

As the IS department matures [6] the CIO must possess the ability to integrate the diverse elements of information resources into the organization which leads a change in the CIO role. In [7] it is argued that the IS maturity changes the managerial roles of a CIO. The entrepreneur role plays a greater role in influencing overall strategy and planning in the organization and translates these organizational strategies and plans into definitive IS actions. As IS matures, the entrepreneur, monitor, and spokesman roles of CIO becomes very important.

Centralization of IS activities also affect the managerial roles of CIO. In [8] it is indicated that as the IS centralizes the spokesman, resource allocator and liaison roles of CIO become more important.

A study [9] on impact of IT investment on their economy between developed and developing countries shows relatively low rate of investment for IT in developing countries indicating the presence of digital divide. The reason behind is the presence of more favorable environmental conditions and more robust institutions in supporting the technical advance for developed nations. However, the gap will not decrease unless the developing nations are taking measure for narrowing the gap. Conducting researches from the context and making use of the result is more realistic than else. Hence, this study investigates the changing role of CIOs in the business organizations in the context and gives the appropriate recommendation for the gap seen.

## 1.2. Statement of the problem

The IT services of organizations led by different IT professionals at different levels of hierarchy. The heads of the IT departments exercise their role in different perspective. As discussed in [4], when the technology advancement gets stronger, becoming more available and affordable organizations will be dependent on IS services. Consequently the complex IT management makes the CIO role in the business very critical and changing. In relation to this it has been mentioned that, on top of the technology knowledge the CIOs need to be a business oriented general manager. The involvement of CIOs in strategic plan development and executive nature of CIO in making decision on the organizational resources affect the alignment of the business with IT. Though this issue has been investigated in the developed nations, we could not get any empirical attempt particularly in a local context.

A research made in Canada and U.S on some large corporations as in [8] suggested that CIOs can understand the world is changing. The change is more competitive business environment, harsher, rapidly evolving technology, and increasingly knowledgeable demanding and diverse user constituencies.

Literatures in [10] and [3] shows the traditional view of IS Managers role were focusing on improving the delivery of large data center-based paperwork processing services. Whereas the current implication of IS management as in [3] shows that the computer infrastructures of organizations are shifting to the new user-dominated technologies, senior management is looking

to corporate IS for leadership and companies are shifting from narrow data processing planning to enterprise wide computer architecture planning.

Similarly, as discussed in [11] the changing technology trend is also showing a powerful movement in the direction of greater distribution and complexity of processing in the organization due to the availability of newer, lower cost, more powerful technologies. The availability of powerful computing devices, software packages and easy to use programming languages requires having resource management. The complex communication that interconnects the applications to single workstations, enabling the various hierarchies of processing and making the database accessible from any point in the organization needs the intensive involvement of the IS managers. This IS management requires to develop an outward business-strategy perspective, on top of the usual operations used.

The CIO role as discussed in [12], is strategic in its nature which is becoming ever more complex, requiring an expansion of the organizational and structural possibilities for filling the role.

To the researcher knowledge, there is no any empirical research made that investigate the changing role of Information Systems managers in the business organizations particularly in the context of developing countries like Ethiopia to clearly figure out CIOs role in the context.

Thus, this research investigates IS managers changing roles, decision power level in the organizational hierarchies and the way they exercise their role in achieving the business objective inferring their short and long term vision. It also assesses if there are differences in changing role of CIOs between public and private organizations. This enable to create awareness about IS managers strategically influencing the business with their expertise (technical and business) that makes their organization more competitive and able to survive in this highly dynamic world. It also becomes a starting attempt for further research in the area.

Hence, this research explores and answers the following research questions:

1. How is the decision power level of IS Managers is changing in the organization?
2. What is the short and long term vision of CIOs or IS managers in the business?
3. What is the difference in changing role of IS managers between public and private organizations?

## 1.3. Objective of the Study

### 1.3.1. General Objective

The general objective of the study is to empirically investigate the changing role of IS Managers in the business organizations in Ethiopian context.

### 1.3.2. Specific Objectives

The Specific objectives of this study are:

- To assess the impact of IS services maturity on the CIO role in the organization
- To identify the gap between CIOs role in exercising their job and expectations from the business organization
- To see the difference in Changing role of IS Managers between public and private organizations
- To assess the critical contribution of CIOs for the business in time difference
- To assess the level of hierarchy the CIOs have in the organization

## 1.4. Scope of the Study

Though conducting the research approaching more organizations in the country yields more satisfactory result, these attempt started by taking samples from each sector that are "big enough" with the IT based services as to the knowledge of the researcher in the country.

This study addressed only the changing role of the CIO focusing on the IS Managers who are acting as head of the IT Services or working closely with the CIO.

The selected major companies that the study focused on are from Manufacturing, Financial, Insurance, Education and Government organizations.

## 1.5. Limitations of the Study

This research has considered the team leaders who are working closely with the IT managers and the directors/managers. As most of the issues are specifically addressed to the CIO/IT manager perspective, the involvement of team leaders (those who haven't practiced the managers' role) might affect the survey result. Hence further research considering only the CIOs might help clearing up this uncertainty.

The other limitation of the work is, due to the absence of empirical study on the status of IT maturity level of organizations in the country, the researcher is forced to select few organizations purposefully. This consideration might affect the involvement of other organizations that are significant for this study. So taking large number of samples to incorporate more organization might resolve this doubt.

Although this research aimed to get answer for short and long term vision's of CIOs or IS managers in the business, high variations in the IT services maturity of organizations and CIOs limited involvement in the organization's strategic work deter the attempt. Considering CIOs with similar IT services maturity and actively involving CIOs in the organizations strategic work can consent to see vision's of CIOs in the business.

The use of"Government" cluster used in the questionnaire, has created some sort of ambiguity. It was used to refer the Ministry organizations and separate private from Government organizations. This has limited the result about the changing role of CIO between private and Government organizations.

Lastly, even though the researcher used both questionnaire and interview for quantitative and qualitative data respectively, result of questionnaire (due to the limitation of the method itself) is skewed to some level on the Likert-Type scale. As a result the researcher gave priority in the analysis for the interview result. Further qualitative research can be done for larger sample (until the "data saturation stage" is reached) focusing on the CIOs or IT managers.

## 1.6. Significance of the Study

This study is believed to benefit researchers, business organizations and CIOs. More particularly, the research provides a clue in understanding of the changing role of CIOs in the business organizations in the context of the developing countries like Ethiopia.

The research is believed to indicate the gap between the actual practice of the managers and expectations from the role. This enables organizations and Managers to take measure in getting the competitive advantage of their organizations business. It also gives evidence that the CIO role is dynamic and is critical for achieving the strategic objective of the business organizations. Moreover, it is an academic practice to fulfill the prerequisite in the program.

## 1.7. Organization of the Thesis

This thesis report has five chapters. Chapter one, the current chapter, is the introduction to the problem and contains the objective of the research together with the specific objectives, scope and significance of the study. Chapter two is dedicated to the literature review. It discusses concepts of the Chief Information Officer (CIO), IT management in the business, competence in IT management, role of CIO in the business and related works. In Chapter three the research methodology and data collection mechanisms, procedures and data validation are discussed. Data presentation, analysis and discussions are presented in chapter Four. Chapter Five presents the conclusions and recommendation made based on the results and limitations of the study.

# Chapter Two
# Literature review

## 2.1. Overview

To have an in depth understanding of changing role of the IS/IT Managers in the business environment related works from journal article and conference proceedings are reviewed. This chapter elaborates the concept of the Chief Information Officer (CIO), changes in CIO role and the dynamism nature of business based on the available prior researches. It explains the IT management in the business, the CIO role in the business and related works in the trends since the introduction of the CIO role, the differences of CIO role introduction and treatment between the public and private sector and the challenges of the CIOs in technology adoption and IT/Business alignment.

The review of research materials supporting the idea in changing role of CIO in the business is made possible by searching research journals or articles from various sources like Google scholar, JStore, AAU digital library, Informatics Bibliography and other sources that are found pertinent. Some of the key words used in searching materials includes IS/IT management, role of IS/IT managers, IT role in business, Changing role of CIO, CIO and role of CIO.

## 2.2. IT Management in the Business

Today in this competitive world, organizations are forced to lower costs, increase quality, innovate in both services / goods offerings and business processes. One of the mechanisms to develop business strategic initiatives in response to the ever-changing market situation is their capability to have an 'IT-enabled' business process and functions.

A research in [13] defined the IT services management as "the management of all processes that cooperate to ensure the quality of live IT services, according to the levels of service agreed with the customer. Initiation, design, organization, management, provision, support and improvement of IT services tailored to the needs of organization are addressed." Hence IT management in the business consists of all processes from initiation of the idea to the actual implementation on the business and as well to the ongoing business processes as per the agreement of stakeholders and the technology standard.

The alignment of business process and ICT goes in line with the business performance of an organization and its effectiveness of doing things. A research in [14] argues that Business/ICT alignment is the baseline for the development of sustainable competitive advantage of organizations. The Information technology services management as in [13] is the management of all processes from initiation to the implementation and as well to the post implementations as per the agreement between stakeholders and the technology standard. Researches in [15] and [16] indicates that organizations with better alignment of the business and ICT have better performance or perceived business process. Hence IT management in business plays great role in aligning businesses and business processes to the ever progressing technology.

According to a research in [17] organizations were supported or dependable on separate applications that has no harmony. These applications range from the critical business applications to the routine administrative tasks. Having such disintegrated application has a consequence in putting administration burden on the management of the technology used and the services given to the business. Hence organizations need to have an amalgamated business and IT strategy to cope up with the ongoing technology improvement and competition.

However, creating businesses fully integrated with the modern information technology and making responsive to the changing market situation is not easy and a onetime task of the information technology management for the business organization. Researches by (Feeny and Willcocks 1998; Rockart et al. 1996; Ross et al. 1996; Sambamurthy and Zmud 1996) as cited in [18] shows organizations that have successfully build the technology and provide effective IT capabilities have learned at least four major things namely:

- Giving better quality services with a minimum cost
- Designing and building an IT architecture considering the technology, data captured and business platforms that are reliable, scalable, adaptable, and shareable
- Building relationships with technology providers, technology implementers, business strategy experts and stakeholders that creates the right IT supported solutions to be predicted, customized and implemented and

- Aligning technology with business strategies so that IT solutions inform future business direction and that IT strategies take in to consideration future business strategies by inculcating the current business strategies

These IT capabilities are highly associated with the IT management skill of chief Information officer **(**CIO**)** in the business.

The IT management in providing the right technology at the right time for having a competitive advantage in the business organization need to build quality IT infrastructure, IT/business group who have humble knowledge of the technology and the business, good relationship with IT and business managers. According to a research in [19] "IT Business experience" and "Relationship infrastructure" are unique "IT management capabilities " of an organization that can make a difference for the competition but the "IT infrastructure" can easily be imitated by other competitor organizations through bench marking. Hence IT management should focus on IT group who are experts in "business strategy, competition, and business opportunities, either through 'learning by doing' organizational processes, or skill sets, create a unique competence that can lead to better leveraging of 'commodity' infrastructure, thereby leading to competitive advantage" [19].

The availability of new technology development together with the competition in the dynamic business environment makes the IT management more complex and CIOs are the right person to alleviate and manage all this taking the lead.

### 2.3. Competence in IT Management

In some organizations IT department is treated as a business supporting function while others understand and treat it as core business that can determine the growth and profitability of the business. A research in [20] indicated that the more the dependency of the business on IT-operationally and strategically, the better the leader get acceptance to be member of the executive team. Due to this and many other factors, the heads of the IT department treatment and required competence is different in organizations.

In relation with the competence of IT Management, the knowledge theory in [19] classifies Knowledge in two broad groups as Tacit and Explicit. Explicit Knowledge is the formal knowledge that can be gained and easily transferrable to others by coding it on different media

while tacit knowledge is the knowledge accumulated through experience and is very difficult to evaluate and codify it.

A manager who is competent in IT should have both Explicit and Tacit IT Knowledge whether his/her primary area is in IT or other business [21]. And he/she also requires having business knowledge so that he/she can play his/her strategic role to leverage the business organization.

The model of IT competence as discussed in [21] explains the explicit and tacit IT knowledge competence that every IT managers/CIOs need to possess is shown in Figure1.

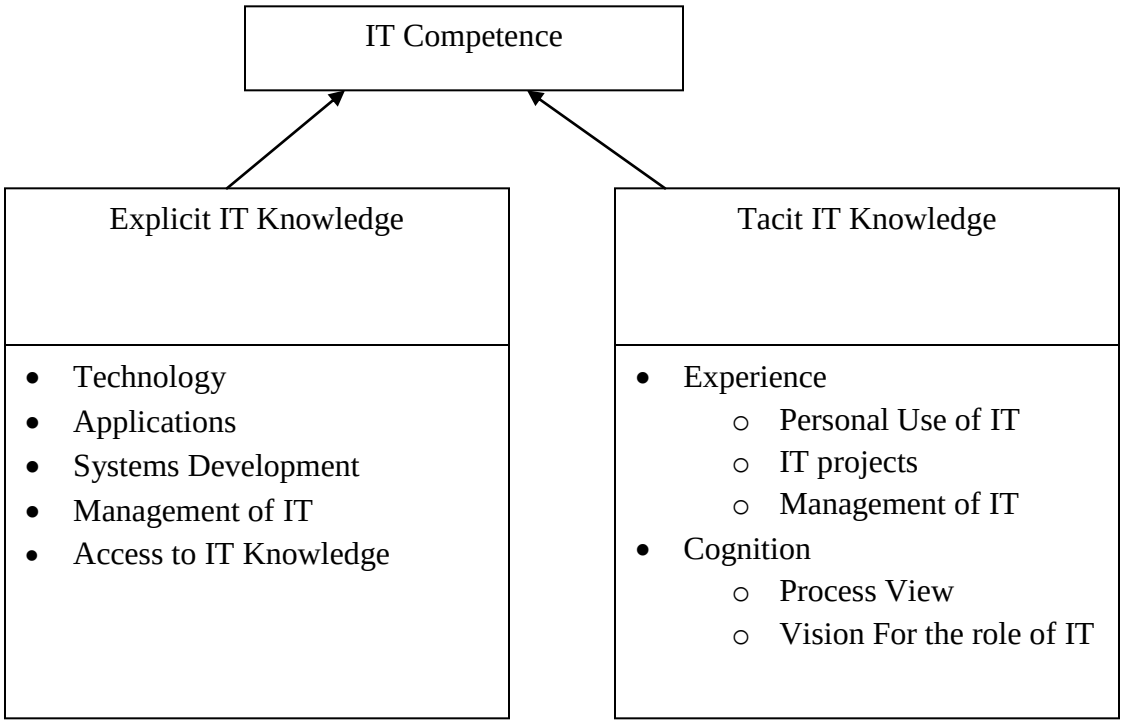


**Figure 1: Model of IT Competence: Dimensions and Components (Source: Bassellier et.al.,2001)**

The IT knowledge of the CIO, though not expected as "perfect" as experts in the IT department like Network Administrator, Database Administrator or others, is the primary tool for his executive role. The explicit IT knowledge refers the knowledge accumulated through education, training, and reading in his career development whereas the tacit knowledge is the knowledge gained from experience, "learning by doing" or observation by involving in IT project management, application development, strategic plan development and other processes or interaction with experts in the area through his/her exposure. The more the Explicit and Tacit knowledge he/she has, the more he/she becomes an ideal resource of the organization to make it better in the competition.

The following table (Table 1.) from [21] explains components listed in the Explicit IT Knowledge dimension of the Model of IT competence shown in the figure 1.

**Table 1: Components of Explicit IT Knowledge (Source: Bassellier et.al.,2001)**

| Components | Specific Elements | Sample Items |
|---|---|---|
| Technology | Current and emerging technologies | Knowledge about how technologies such as computers, client/server computing, LAN, and multimedia can be valuable to the organization |
| | Current Assets | Knowledge about the existing technology portfolio in the business area |
| | Competitors' use of IT | Knowledge about how competitors use IT to support similar business areas |
| Applications | Current and emerging applications | Knowledge about how applications such as e-mail, intranet, and groupware can be valuable to the organization. |
| | Current assets | Knowledge about the current application portfolio in the organization |
| System Development | Development methodologies | Knowledge about different development methodologies such as traditional system development life cycles, end-user development, prototyping, and access service providers can be valuable to the organization |
| | Project management practices | Knowledge about how project management practices such as staffing, scheduling, and budgeting are of value to the organization |
| Management of IT | IT planning and business development | Knowledge about the IT strategies, policies, and vision statements used in the organization |
| | Resource allocation | Knowledge about the allocation of financial and human resources for IT in the organization |
| Access to IT knowledge | Mapping of IT-knowledgeable people | Knowledge about IT-Knowledgeable people within or outside the organization that one can contact when IT information is needed |
| | Mapping of secondary sources of IT Knowledge | Knowledge about secondary sources of IT knowledge (e.g. Internet, journals, conferences) |

This table (Table 1.) shows the CIO can accumulate his knowledge about the technology, application features, system development methodologies and managing system development projects, management of IT operations as a whole and mechanism in accessing IT knowledge from others from the formal education process.

On the other hand, the Tacit IT knowledge components of the Model in IT competence as in [21] are explained in the following table (Table 2).

**Table 2: Components of Tacit IT knowledge (Source: Bassellier et.al., 2001)**

| Components | Specific Elements | Sample Items |
|---|---|---|
| Experience | Personal use of computers | Use of desktop software for personal productivity |
| | IT project Experience | Participation and/or leadership in the following activities<br>• Initiation of new IT projects<br>• Definition of the cost and benefits of a specific IT project<br>• Management of IT projects<br>• Development of work within IT projects<br>• Implementation of IT projects |
| | Management of IT | Participation and/or leadership in:<br>• Creation of a clear IT vision of how IT contributes to business value and strategy<br>• Development of IT strategy<br>• Creation of IT policies within the enterprise<br>• Setting IT budgets |
| Cognition | Process adaptiveness | Business activities are understood either as:<br>• Activities located within the business areas<br>• Activities that cross business areas but are within the organization<br>• Activities that cross the organization boundaries and connect to customers and suppliers (Adapted from[60]) |
| | Vision about the role of IT in organization | IT is seen as a tool either to:<br>• Automate: The role of information technology is to replace human labor and enhance human productivity through automation<br>• **Informate down**: The role of information technology is to provide information that gives a better picture of the operations and help employees gain better insights into their own activities<br>• **Informate up**: The role of information technology is to provide information that allows a clear and organized management view of the state of the business.<br>• Transform: The role of IT is to fundamentally alter the industry or organization through new products or business strategies, often including redefinition of relationships with customers and suppliers.(Adapted from 64) |

The experience in using computers for personal productivity, involving and leading projects from the initiation to the implementation stage, participation in the strategic plan development and adapting processes and formulating vision by incorporating IT playing role for the organization's benefit can be accumulated through practice and process.

Hence, the IT managers who have high level of IT knowledge both tacit and explicit will have the potential to improve the IT infrastructure, enhance IT business skills and create a better relational infrastructure that create a competitive advantage for the business organization [22].

A research in [4], also indicated that the emerging CIO role requires a set of managerial skills and attributes not only important to the IS executives but also critical in the business. The understanding of the technology by CIO is not enough rather he/she must be "a general – business" oriented manager with considerable political, organizational, and communication skills.

IT management as in [21], is similar to other business streams that needs vision and goal setting, allocation of resources and monitoring of progress. The vision setting competence as cited [60] in [21] enable IT managers to have strategic IT plan that can be assimilated to the current technology and business in achieving competitive advantage.

One of the CIOs role, the strategic IT planning, as [13] information system management (ISM) is the critical issue in organizations to achieve competitive advantage because it is the driver of business activities in the organization. It needs to be done in collaboration with the IT and business professionals so that it meets the organization vision. The Strategic plan which is clear and owned by stakeholders is most likely a plan that can definitely be achieved and make the organization more beneficiary. Hence the IT competence of the manager plays great role in the organizational strategic planning and its achievement action plan.

### 2.4. The Role of CIO in the Business

The Chief information officer (CIO)/IT manager is the highest decision making person in all IT related issues of the organization. Business organizations need the day to day involvement of this role in making use of the IT technology and services.

As a research in [18] CIOs add value to their organization, playing the spokesperson role by creating relationships with other senior executives and making IT a strategic tool to inform organization's business strategy. This research emphasized key responsibilities of CIO positions. One of these responsibilities is establishing and managing the IT infrastructure, the IT skill bases, the web of relationships (internal and external to the organization) and creating IT based initiatives for organizational competitive advantage. The other is proposing, implementing and

improving the management process that makes the IT function as an efficient and effective 'production engine' capable of installing new applications in a timely manner and availing them in a cost-effective and dependable manner. Creating and maintaining relationship with vendors and partners to plan, implement and improve the requisite management processes to assure the optimality of IT sourcing decisions as well as facilitations and monitoring of the resulting contracts with third-party service and asset providers are also responsibilities of CIOs.

Considering the CIOs decisions location, communications and information flow, a research in [2] has grouped the leader and resource allocator roles as internal to the IS department and the other four roles (Spokesman, Entrepreneur, Liaison and Monitor) as interaction between the business functions and across organizations (between organizations) as seen in the Figure2.

Hence the CIO role plays a determinant factor in the organization helping to adopt and create an IT enabled situation that can let the organization best fit or compete with other similar organizations in the Business environment.

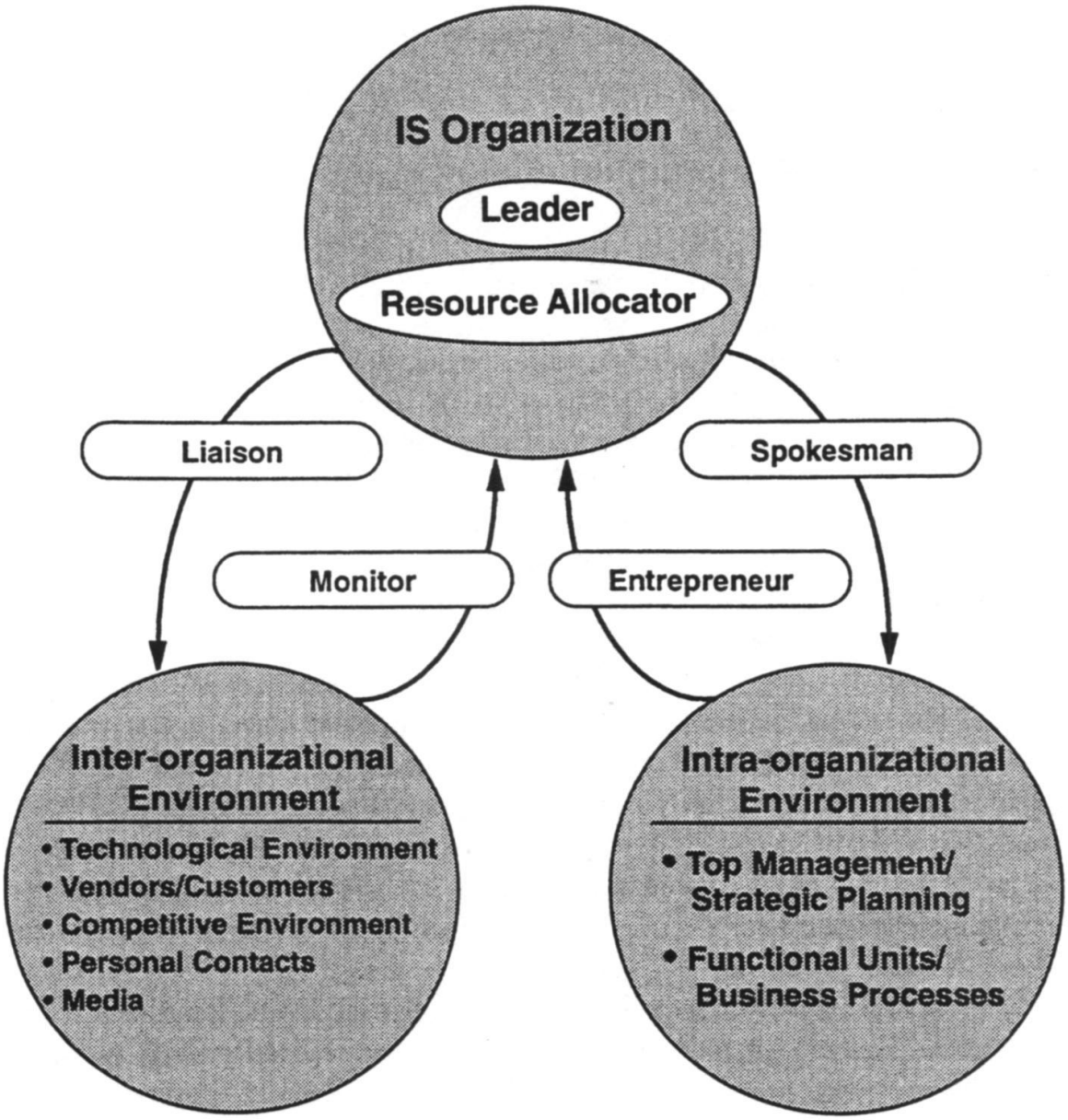


**Figure 2: IT managerial roles (Source: V. Grover,1993)**

Another research in [14] shows the competitive advantage of IT investment is result of efforts exerted in creating better management of information technology, mobilizing and making use of organizational resources in designing, acquiring, implementing and applying of ICT for the fulfillment of the strategic objective and making effective strategic information systems planning, business/ICT alignment and infrastructure establishment that can afford business interaction.

Though the proposed solutions for getting the competitive advantage of ICT investment for organizations are the responsibilities of the CIO, a research in [17] shows that very little academic research has been conducted on the issue and its constraints.

Even though some researchers suggest that investing in and exploiting ICT gives organizations competitive advantage, others argue that developing a "superior technology" by itself is not enough. The issue comes after making the organizations to obtain the exact competitive benefit from their investment in ICT. The responsibility of getting the exact "competitive advantage" of the ICT investment challenges of an organization is the responsibility of the CIO as in [17] but making the organization technologically competitive should be responsibility of every member of the management team and the organization as a whole.

A research in [23] suggests that CIO should function as "executive" rather than as a functional manager and focus on strategy development to bridge the gap between information technology groups, business units and external bodies. Although the CIO's focus and technical expertise is different from the technical experts and line managers of the IT department, he/she has to have rich enough knowledge in both IT and Business. A research by Fiegener and Coakley (1995) as cited in [24] the 'CIO's hesitance to exert influence may increase the risks that the agenda for IS will be shaped by other, less knowledgeable sources '. Hence the CIO is expected to prompt thought leadership to other top management members and be influential for all technologies implemented in the organization.

According to a research in [23] the extent of resource allocation authority and informal acceptance of the CIO among peers in the management influences the strategic nature of the role that the CIO plays. CIO with higher authority in the organization is more accepted by the subordinates and peers in the top management as a result he/she will have a potential to contribute more in the strategic plan development. At situations where the CIO lacks formal authority, he/she should use the influence to affect the behavior and thinking among peers by showing them his/her contribution and the benefit of the technology he/she is in charge of [24].

Departments or work units of organizations are seen acquiring and implementing different IT systems as per their need. Those systems could have poorly defined functions or used keeping redundant information. Creating an aligned IT/business strategy will solve such issues. The CIOs influence behaviors can be most effective when he or she attempts to initiate or implement strategic information system projects that require commitments of other business managers [24].

A research in [17] explained that organizations that were supported or dependable on separate applications have no harmony. These applications range from the critical business applications to the routine administrative tasks. Having such disintegrated application will have a consequence on the administration burden of the CIO role. Hence, it is the role of the CIO to shape or propose and enforce the organization to have an amalgamated business and IT strategy that let the organization copes up with the ongoing technology improvement and competition.

As in [17] the "Chaotic" real-world of enterprise-wide IT system enables the Enterprise Architecture discipline to be born. The discipline focuses on the technical aspect as well as the organizational context at which the IT system works in. It also enables to get the Knowledge base and decision support information on an IT related issue of a company for stakeholders.

Enterprise Architecture as discussed in [17] is a high level description of the basic arrangement and connectivity of system components physically or conceptually. It comprises of the components that make up the overall system and enable to have a blueprint of the actual system that enable for common understanding among the stakeholders. According to same research [17], CIO is the sole player of the EA for making it comprehensive enough and as clear as possible for all in aligning the business and ICT vision of the organization. Therefore, the CIO role in making use of the EA in all planning across the organization should be recognized by all communities in the organization.

Another research in [14] shows Business/ICT alignment is the foundation for sustainable competitive advantage of organizations. Research in [16] also argues that the greater the alignment between the business and the ICT the superior performance or perceived business performance. Hence, the role of the CIO in aligning the business with the ICT plan, process and vision will bring a positive result on business performance and effectiveness ensuring the competitive advantage of the organization.

A research by Gottschalk (1999) as cited in [17] enumerates six different CIO roles.

> "*The Chief architect who designs future responsibilities for the business, the Change leader who arranges resources to achieve optimal implementation, the product developer who helps defines the company's place in the emerging digital economy, the technology developer who embeds IT into the business strategy, the chief operating strategist who invents the future with senior management and the Coach who trains people to acquire the skill sets they will need for the future."*

This indicates the CIO role plays much broad technical and managerial skill that can contribute a lot to embed the IT to the business for the success of the organization in the business.

Moreover, as cited in [22] CIO has a great role in creating and maintaining good relationship between the IT and business departments. The relationship between IT/Business plays a great role in creating a competitive advantage of organizations. As creating such relationship is a continuous effort of organizations it is very difficult to be imitated by competitors [22].

However, according to survey in [23] the ability of the Senior Executive member (CIO), in bridging the gap between Information Technology unit and strategic objective of the business organization is influenced by five factors:

1. **The nature of the CIO's Scheduled meetings**: CIOs commitment to involve in larger, longer and pre arranged meetings with people from outside the information technology unit. These scheduled meetings enable CIOs to narrow the gap and create an understanding of information flow to the business. The more scheduled meetings he/she has, the more he/she becomes effective.

2. **Interaction outside the information technology unit:** CIOs engage majority of their time interacting outside the information technology unit or groups having participants from information technology unit and other areas. This lets them get more understanding about technology and business from the interaction and similarly use the opportunity to speak about their organization business.

3. **Maintaining long-term, strategic focus for job responsibilities and purposes**: CIOs focus should be more toward the long term than the day-to-day functioning of the information technology unit. A survey result as discussed in [23] identified eight areas of responsibilities of CIO and six of them are more of long term duties in nature(which accounts 80% of CIOs contact time) while the remaining two are operational and tactical in nature(which accounts for 20% of the CIO contact time ). The CIO responsibilities shown in Figure 3 indicate the distribution of the scheduled time among these identified responsibilities of CIOs.

The strategic and coordination responsibility of the CIO(as seen on Figure 3) took the majority of the contact time while the approving, coordination and scanning the environment takes high

percentage of mail communication. CIOs focusing on the strategic nature of tasks are better than those working on the routine tasks.

4. **Skills in reading of situations**: the CIOs interaction with other business units and peers enable them to read the environment and respond appropriately.

5. **Participation in strategic meetings**: CIOs should participate and contribute a lot in strategic meetings.

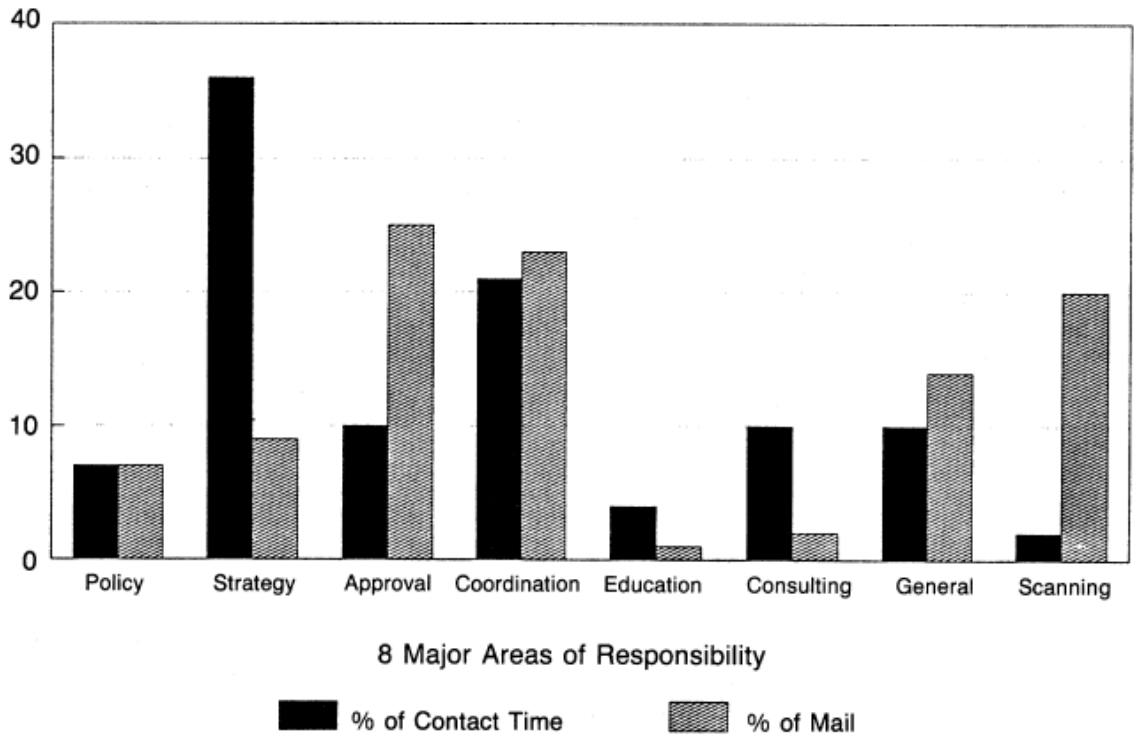


**Figure 3: CIOs Scheduling for Responsibilities (Source:** Charlotte S. Stephens et.al., 1992**)**

As discussed in [17] , the degree of the authority of CIOs differs from organization to organization but generally accepted that the role is responsible for all IT related decisions. The authors of same article argue that, the CIOs role is influenced by two factors. First, formal authority of CIO has in resource allocation and decision making. The higher the authority is the better heard by subordinates and colleagues with logical reasoning. The other factor is good informal relationship among members of the organizations. Having informal relationship is good in facilitating issues and minimizing resistance.

Similar researches by Earl and Feeny (1994) and Stephens et al. (1992) as cited in [24] have argued that one of the critical natures of CIOs strategic role is to influence in idea to other executives making them aware the potential of information systems to support and enhance the strategy of the firm. The study suggests one of the techniques to make this possible is "*by creating proactive influence behaviors to convince other top managers to allocate attention and resources to strategic information systems projects."*

Although, CIOs with higher informal acceptance can work more in achieving their strategic target even in the absence of the formal authority, formal authority and status as in [23] is necessary for CIOs to be effective in their duty but it is not the only option as it will not be sufficient by itself. Hence, CIOs should build good relationship to get the informal acceptance among organizational members.

### 2.5. Related Works

A research [25] titled in "CIO Reporting Structure, Strategic Positioning, and Firm Performance" indicated that the CIO position is introduced in 1980s. This position is getting more influential as IT plays major role in business process and overall business strategy of organizations. CIOs are becoming the members of the "C-Level executive team" playing influential role besides controlling the IT functions like managing the organization's information resources, presenting vision for the role of IT in the organization, promoting IT as an agent for business change, redesign organization's strategy, and creating business value.

But there is a debate or no agreement on the reporting structure of the position. Some argue that CIOs directly reporting to the CEO has high influential power and indicates the importance of the IT for the organization while other professionals' debates saying it should report to the CFO to get the budget of the IT investments.

The purpose of the research [25] was "to challenge the assumption CIO-CEO reporting structure is associated with the strategic role of IT in the firm while CIO-CFO reporting structure is associated with a diminished role of IT." Arguing that the strategic role of IT determines the CIO reporting structure by proposing that it is the firm's strategic positioning that influences the CIO reporting structure. Hence organizations can make the CIO to report for any C-Level executives based on the strategy followed not only to the CEO or CFO.

The research method used was integrating two surveys on the CIO reporting structure with the financial information from *Compustat* and corresponding stock return from the center for research on security prices (**www.crsp.com**). The primary data was taken from the *InformationWeek* (IW) (1990–1993) survey of IT executives US firms taking the first 200 instance's of the firms CIO's reporting structure. The second dataset used was taking 58 publicly traded US firms whose financial and stock information matched from a survey of 124 CIOs of Fortune Global 1,000 firms labeled 2006.

The findings of the research show that the CIO-CEO reporting structure might not be correctly working for all organizations and it is not the function of a strategic and non-strategic role of IT, rather the CIO reporting structure depends on the organizations strategic positioning

The research has reported three findings. First, strategic positioning influences CIO reporting structure, irrespective of IT intensity (or strategic role of IT). Differentiators tend to have their CIO report to the CEO, while cost leaders tend to have their CIO report to the CFO. Second, alignment between a firm's strategic positioning and its CIO reporting structure positively affects firm performance. Third, well aligned reporting structure outperforms than misaligned structures confirming the CIOs and their leadership requirement in aligning the IT with firm's Strategy.

The limitation of the research is it has done the data analysis based on the prior survey data in the 1990-1993 and the 2006 periods which might not be generic to infer for all. The other is categorization of firms' strategy as either differentiators or cost leadership might not work perfectly for all types of business like services. Other variables like the background of the CIO, top management membership, skills and education and past positions might also be considered to determine the reporting structure of the CIO in a given organization.

A research in [8] is reviewed that examined the trends of changing roles of CIO based on "prediction" by Rockart, Bullen and Ball [6] as in [8].The purpose of the research was to prove the three prior predictions by Rockart, Bullen and Ball.

The first is about Decentralization of line Responsibilities to divisions and departments. As it is very difficult for the CIO to reach over all IT infrastructure and services through-out the company,' line management of local hardware and much of the software development will be shared into divisions and departments' whereas "the communication network, corporate data

management, common software development (including a changing array of start-up projects), and the corporate computing facility" remain in CIOs direct supervision.

Second, staff orientation of organizations need to have a focal point for planning and facilitating the organization's move into the information era. As the CIO will increasingly focus on strategic issues and planning he/she will follow "facilitating, guiding, and promoting change but will not control it."

"The techniques utilized by CIO to guide, facilitate and promote are communication and education processes, standards (e.g. for data, communication, privacy and security) and other indirect controls (steering committees, policies, guidelines and individual persuasion)." Hence the CIO is expected to be 'gate keeper' and 'integrator' of the vast technological resources that need to be decentralized throughout the organization rather than acting as the 'owner' of a centralized IS technology.

Third, the corporate responsibility for information resource policy and strategy is responsibility of the CIO as he/she is member of the top management team similar to the CFO (chief financial officer) who is in charge of the financial resources of the organization. "The CIO will have 'the responsibility of assuring that new opportunities presented by the technology are seized and that capital expenditures for information resources are ranked according to business needs.'"

The target of the research was to "test the three predictions of Rockart, et.al., to determine whether or not they are validated " in successful CIOs day to day activities. They used exploratory model in validating the conclusions made. The researchers sent questioner for 25 "large" US and Canadian corporations of whom 20 responded. The respondents had a long term connection as sponsors of the Center for Information Systems Research (CISR) at the Sloan School, MIT, which the researchers are highly confident by the response. They reviewed the result with respondents at workshop in May of 1983.

Our research methodology is different in which the data collection mechanism used interview on top of the questioner used. Furthermore the respondents have no any prior connection with the researcher that biases the result which is cited as limitation in the paper.

The research model used was exploratory based on the predictions discussed above on the emerging CIO role and the associated managerial attributes of the role to validate whether born-out by the actual experience of successful CIO's in large corporate environments or not.

The results of the survey on these three predictions are discussed as:

Concerning the decentralization of line Responsibilities the "CIOs were asked to indicate the location of responsibility (Corporate IS, Subsidiary IS groups or User management) for an executive list of staff and line activities" and the result shows major elements of line responsibility like development and operation of application systems, and line management of hardware and software including the budgeting and architecture design of applications distributed to line managers. Whereas developing and maintaining of information utilities like corporate IS infrastructure remain under control of CIO.

Regarding the staff orientation, the survey has found critical responsibilities at present and three years to the future showed a sharply defined picture of the CIO role as a" *high level manager who is primarily concerned with issues of long range planning, consultation and support to a broad set of constituencies throughout the organization."*

In relation to the Corporate Responsibility for information resource policy and strategy, the result shows CIOs are "proactive executives", focus on strategic initiatives like strategic planning, business/IT alignments and gaining competitive advantage. CIOs were asked to indicate their reporting relationship to other top managers, particularly the CEO and the result shows CIOs are proactive executives who, in general, reports to the CEO or one level below, and are aligned through their reporting relationship to the strategic and operational elements of business.

Another research in [26] with title of "Roles, Responsibilities and futures of CIOs in the public sector" reported about the difference in roles and responsibilities of CIOs in public and private sectors. The survey discussed that the there is a clear difference between the public and private sector in introduction and practice of the CIO role. It indicates the CIO role first introduced in 1981 and is" well developed" by the private sector while it is "still on formative stage" in the government sector.

The purpose of the research was to describe the role of the CIO by discussing the responsibilities trend indicating the future expectation of the role. Review of Literature and analysis of models from the prior research was used as methodology.

The findings of the research state that "while private sector organizations were experiencing success with the implementation of the CIO in their organizational structures, the public sector has still recognizes the new executive position." It is on the infant stage in the public sector

unlike to the private sector. The trend of the CIO role also indicates that, to function and integrate with the organizations executive team, CIOs must have managerial skills not purely technology expert.

A research by Polansky et.al(2004) as discussed in [26] summarized the future role of CIO as:

> "*responsibilities will continue to shift from technical/operational to a strategic/management focus; The CIOs success will be redefined to encompass strategic, enterprise-wide business goals and objectives; The focus of the CIO and the mission of IT will be redirected away from internal customers, and focused more towards external customers, partners, service providers and other links in the extended value chain; Human capital management will become a key CIO responsibility; CIO responsibilities will include IT portfolio management, IT investment management and risk assessment; Business continuity and disaster recovery will continue to be seen as primary CIO responsibilities; Actionable business intelligence will become a standard deliverable from IT; Increasing importance on Governance will require the CIO to develop a deeper understanding and intuitive grasp of corporate finance and accounting processes; CIOs will assume a greater leadership role with a focus on shaping and creating a world economy fuelled by information."*

This list of future CIO role takes in into consideration the dynamism of business and technology environment and application to the role. The role also continues "campaigning for a change in attitude to IT" and "asking executives to consider IT as an important component of business."

Another research work [17] based on a survey made in Swedish CIOs identified most important concern of CIO. Accordingly the challenges of IT management are tremendous and are becoming the CIOs main concerns in the organizations.

As reported in the paper, in earlier periods, IT management focused mainly on the technology and the quality of IT was assessed by considering the "System per se." But today evidences are showing that IT systems cannot be evaluated separately. For instance, whether or not the systems are efficient, usable or secure has to do with the situation/environment that they are executing in. This indicates there is a need to include the business analysis as a standard tool for IT management.

CIO, the chief executive of an organization, primarily focuses on strategic information system planning. Some of the broad technical and organizational scope responsibilities of the CIO are IT-Business alignment issues; IT investment decisions; IT system quality assessment and improvement; Creating IT policies that regulate how IT services are provided to different departments and Managing human resource of the IT department.

These and many other responsibilities of the CIO make the role more broad and chief executive of the organization. It also emphasizes the need to have technical and business knowledge and managerial skill.

The Survey in January and February,2004 on Swedish CIOs from services, industry, public administration, trade, bank/finance/insurance, transport and others were asked "*which concern is most important for you as a CIO?*" and to state their title and whom they are reporting to so that respondents are only CIOs.

Respondents were contacted to fill the online survey via email stating the purpose is for understanding of issues and constraints of CIOs prioritized most important concerns. The survey question and instruction was published on internet keeping the responses confidentiality. For those who didn't respond, second email was sent out reminding them to participate in the survey and 22 %( 62 of the 283) of them replied. A web based prioritization tool was used to pick two concerns and lets them perform a pair wise comparison. The survey used multiple comparisons for each concern using a nine grade-scale ranging from' Concern A is much more important than concern B', to 'Concern B is much more important than concern A' and finally to 'Concern A and B is equal'.

The problem the survey trying to investigate was the discrepancies between Enterprise Architecture frameworks (Department of Defense Architecture framework and Zackman Framework for Enterprise Architecture) in relation with addressing the CIOs most important concerns. It also identified the CIO's role in their most prioritized concerns.

The reported survey results in relation to the CIOs highly prioritized concerns are to decrease the cost related to the business organization such as cost for personnel in the business; to improve the quality of the relationship between the IT and business in the organization such as support, helpdesk and end-user training; to provide new computer-aided support to the business organization such as new functionality, new information, and communication means. This shows

that the CIOs have strong focus related to business organization more specifically the IT-Business alignment unlike to the technology mastering.

Although the academic discipline believe that all decision on IT related issue supported by the Enterprise Architecture, the Survey result showed none of the identified concerns are addressed by the Enterprise Architecture frameworks (DoD and Zackman Frameworks) as the current concerns of CIO are in cost reduction and Business/ IT alignment. Hence Academic researches on frameworks utilization for CIOs concerns are required.

The above mentioned reviews of related works indicate the attempt of empirical studies on the CIO reporting structure and strategic positioning in the organization, changing roles of CIOs, difference in CIO role practice between public and private sectors and concerns of CIOs and gap in Enterprise architecture frameworks. As a summary, the related works discussed above are shown in Table 3 below.

## Table 3: Summary of Related Works

| Author, Title and Year | Purpose of the Research | Key findings | Recommendation and Future Work | Remark |
|---|---|---|---|---|
| Rajiv D. Banker, Nan Hu, Paul A. Pavlou and Jerry Luftman<br><br>CIO Reporting Structure, Strategic Positioning and Firm Performance<br><br>(June,2011) | "to challenge the assumption CIO-CEO reporting structure is associated with the strategic role of IT in the firm while CIO-CFO reporting structure is associated with a diminished role of IT." | CIO-CEO reporting structure might not be correctly working for all organizations<br>• strategic positioning influences CIO reporting structure<br>• alignment between a firm's strategic positioning and its CIO reporting structure positively affects firm performance<br>• Well aligned reporting structure outperforms than misaligned structures. | No recommendation is stated<br><br>Future work on<br>• finer classification (differentiators or cost leadership) of a firm's strategic positioning<br>• Testing theoretical explanations for the proposed hypotheses<br>• Verifying other variables like the back ground of the CIO, top management membership, skills and education and past positions to predict the CIO reporting structure | It is analysis based on Secondary data (two Surveys done before).<br><br>• It has done the data analysis based on the prior survey data in the 1990-1993 and the 2006 periods which might not be generic to infer for all.<br><br>• Categorization of firms' strategy as either differentiators or cost leadership might not work perfectly for all types of business like services. |
| Robert I. Benjamin, Charles Dickinson, Jr. and John F. Rockart<br><br>Changing Role of the Corporate Information Systems Officer<br>(Sep., 1985) | "test the three predictions of Rockart, et.al., to determine whether or not they are validated " in CIOs day to day activities | The pace of changes in adaptation is much faster than anticipated by Rockart and his colleagues | No recommendation is stated.<br><br>Future work is indicated by raising RQ:<br>• To what extent is the pattern of distribution of the IS function related to the size of the companies, to the type of industry, and to organizational Cultures?<br>• To what extent will the distribution of responsibility from subordinate IS to user management follow the pattern of distribution of responsibility from corporate to subordinate IS? | Respondents of the research are those having high contact each other discussing the issue and are all from "large corporations " that influence the result and not random.<br><br>It is Survey research with sample size 25 of whom 20 have responded resulting in 80% response rate. |
| R. Lawry,<br>D. Waddell and M. Singh | the role of the CIO in the public sector by discussing the responsibilities trend to | • The CIO role is on the infant stage in the public sector that is not | Not explicitly stated but implicitly notify the requirement academic | • Broad classification of sectors in Private and Public might hide the |

| Author, Title and Year | Purpose of the Research | Key findings | Recommendation and Future Work | Remark |
|---|---|---|---|---|
| Roles, Responsibilities and Futures of Chief Information Officers (CIOs) in the Public Sector<br><br>(2007) | indicate the future expectation in the sector | successfully implemented and aligned with the government strategies unlike to the private sector.<br>• The trend of the CIO role indicates the requirement of strategic/ managerial skill on top of the technical/operational skill. | research on the public sector and future of the CIO. | efforts in profit making institutions (Banking and Finance in Ethiopian Case.)<br>• Power of the authority in Private versus public sector is not discussed (privates are 20+ Yrs ahead in appointing but that does that mean … can make the decision.) |
| A.Lindstrom, P. Johnson, E. Johansson, M. Ekstedt and M. Simonsson<br><br>A survey on CIO concerns-do enterprise architecture frameworks Support them?<br><br>(2006) | Investigating the discrepancies between Enterprise Architecture frameworks (Department of Defense Architecture framework and Zackman Framework for Enterprise Architecture) in relation with addressing the CIOs most important concerns. | • CIOs most concern are Cost reduction and Business/ICT alignment<br>• The Enterprise Architecture frame works are not assisting decision making responsibility of CIO in planning and managing Cost<br>• CIOs in large organizations have more business-oriented focus than in small organizations | No recommendation and future work is specified. | It is a survey research with sample size 283 of whom 62 have responded with a response rate of 22%. |

# Chapter Three
# Research Methodology

## 3.0. Overview

This study investigated the gap between CIOs role and expectations from the Business organizations, difference in changing role of IS managers [27]between public and private organizations and the critical contribution of CIOs for the business in time difference. Moreover, it has made efforts to assess the level of IT Services maturity impact on the CIO role and the level of hierarchy the CIOs have in the organizational structure.

This chapter presents the methodology that is used to achieve the objective of the study. First, the general research approach is discussed. Then, the data source and sampling techniques are described. Next, Data collection and analysis techniques and procedures are discussed. Finally validity and reliability of the research are presented.

## 3.1. General Research Strategy

### 3.1.1. Research Approach

The general approach of this study is survey research that uses a combination of quantitative and qualitative methods to collect and analyze data. As indicated in [27] a survey research is an inferential approach in research to form a quantitative data to infer characteristics or relationships of the population from which the sample is taken. Another scholar as in [28] explained survey research is a quantitative method that capture" standardized information" about individuals, groups, organizations, or communities being studied. Hence, the survey method used is believed to be appropriate for studying the changing role of the CIO in the business environment. A survey research is devised to examine a phenomenon or situation in different condition at its natural settings.

The study also answered the level of the progress in decision power of CIOs/Managers in the organization, the short and long term visions of managers in the business and the differences between public and private organizations in the role change.

### 3.1.2. Data source and Sampling

The data source of the survey is from highest officials of the IT/IS departments, the team leaders or vice managers or directors that are working closely with the manager of the IT/IS department. Even though conducting the survey research taking large number of organizations (population of the survey) is believed to give more realistic data, twenty organizations, four from each sector namely Manufacturing, Financial, Insurance, and Education and Government sectors are selected using purposive sampling. The purpose and focus of every business organization in each sector has variations accordingly but this study focused on the CIO role considering the availability of similar management (application or services, infrastructure and support functionalities of the IT department) perspectives in all sectors. The selected organizations are those having separate IT department and the researcher believed to have "Big enough" IT based systems and organized IT management that play major role in the business. Although this sampling is not perfect enough to generalize the result for the whole population, it is used for generalization of similar context.

Accordingly, since the main focus of the survey is to know the changing effect of the CIO role in the business environment, considering three people (the IT/IS Manager, the infrastructure team leader and the application or support team leader) a total of sixty people, who are working more closely with the IT/IS manager or who were working as the manager/director of the IT/IS department, are considered to fill the questionnaire for the quantitative data. Moreover, for the qualitative data capturing six managers/directors (three from public and three from private) who are volunteers for the interview purpose are selected. The interviewees have all filled the questionnaire and are working as top management of the IT department in their respective organization.

The survey has collected data related to maturity about the IT services / infrastructure, CIOs involvement in the strategic issues, CIOs managerial role practice, alignment of IT/ business strategy and organizations IT competence level using Questionnaire items as shown in Appendix IV. Qualitatively (see Appendix V), the survey also has collected data related Educational background and experience of CIOs, Roles, Responsibilities and Scheduling, perception the change in CIO role past and to the future, level of the CIO decision power / hierarchy in the organizational structure, IT competence level of the organization, short and/or long term vision and challenges in aligning IT/Business strategy. Both the quantitative and qualitative methods have demographic data.

## 3.2. Data Collection Technique and Approaches

The techniques used for collecting the required data were questionnaire and interview. The data collection techniques used further described below:

### 3.2.1. Questionnaire

The data collection instrument was mainly developed from a synthesis of literatures that are appropriate to attain the objective of this study. A 7-point Likert-Type scale questionnaire was used to collect data from IT/IS managers, directors, vice managers and team leaders who have the qualification and work experience more close to the IT manager / CIO level. Accordingly the Likert-Type scales for the first theme (Basic Function) ranges from 1= "Not important" to 7= "Extremely important" and for the second theme (Maturity Function) ranges from 1= "Not at All" to 7= "Very Great Extent".

The questionnaire development was done in two-steps. First, the questionnaire items were adopted from literatures [2] (which studies about managerial role) and [29] (looks old but can measure the current situations we are in) that are relevant to measure the identified constructs discussed in the specific objectives of the study. Some minor customizations were made to the questions in order to reflect the objective of the study. Secondly, the questionnaires were reviewed and edited by experts comment in the area both academicians and practitioners' to validate the content addressed in the survey instrument and the questionnaire is distributed for about 15% (ten people) of the sample in the pilot test survey. Although a research in [30] advises to take sample sized between10 to30 for pilot test survey, I chose the minimal value (ten) for the sake of simplicity and time factor. The objective of the pilot study was to test whether the questionnaire elements are clear, consistent and accurate information.

Accordingly, based on the feedback given by respondents in the pilot survey, some questionnaire items were modified to reduce bias and maximize the response rate. The original question used in the pilot study (*How many years have you worked in the organization?*) is changed to (*How many Years have you worked in your present position?*) to explicitly get the service on the CIO position. The other thing edited after the pilot study was the online form which were set as required to optional giving the respondents freedom in answering the items in the questionnaire.

The questionnaire has four parts. Part one is about demographic data consisting of nine questions. Part two contains basic functions that are related to CIOs tasks and schedule comprising of ten questions. Part three address the maturity of IT/IS functions having a total of ten questions again. Finally part four contains two open ended questions to let respondents' express related matters.

### 3.2.2. Interview

When looking for opinions, experiences and personal information from respondents in key position as indicated in [31] using interview is an appropriate option. Similarly, as discussed in [27], interview technique is used to get an in depth information, skilled interviewer can overcome resistance of interviewee and validate the respondents response while the interview is going on. Hence, the required information which was addressed in the questionnaire according to the objective of this study is cross checked and validated on top of collecting information that is not easily grasped from the questionnaire.

## 3.3. Data Collection Procedure

Before the data collection activity proceeding, the researcher has approached respondents to know the convenient option for the questionnaire to use. Accordingly, the Questionnaire is prepared and distributed in multiple options taking the convenience of the respondents in to consideration. These options used to prepare the questionnaire are in Word format to send via email or to use the printed hard copy and / or the online Google forms (https://docs.google.com/forms). Though the researcher has used multiple attempts to reach at respondents, the response rate was law. As a result additional notifications explaining the objective of the study in mail and phone call via influential person have been used to maximize the response rate.

The other option used to increase the response rate was to send for more organizations in the sector that the response rate declined. As a result, the questionnaire was made to reach at IT professionals (who are directors, managers and/or team leaders) who are managing the IT infrastructures and services in different sectors.

The filled questionnaires were collected within three weeks period (from April, 2016 to May 15, 2016). After the data is collected using the survey instrument, the resulting data encoded and cleaned on IBM Statistical Package for Social Science (SPSS) version 20 software used for the analysis.

Data cleaning was conducted for the open ended section of the questionnaire to avoid possible omissions, missing items and errors and/ or outliers. From a total of 60 questionnaires distributed, 43 were collected in hard copy, through email and the online Google form via the link specified above. This shows the overall response rate is 72%. Among the 43 collected responses, 4 is incomplete and omitted, leaving the 39(each representing all stated) responses for the analysis of the study.

In order to ensure the task of addressing all the research questions raised and achieving objectives of this research, the following mapping mechanism was used in effective alignments of the questionnaire and the interview questions as shown in table 4.

## Table 4: Mapping of Data Collection instruments with the Research Question and Specific Objectives Set

| Research Questions | Specific Objectives | Articulated Questions |
|---|---|---|
| RQ1: How is the Decision Power of IS Managers is changing in the Organizations'? | SP1: To see the impact of IS services Maturity in the CIO Role | DD6, DD7,DD8, |
| | Sp5:To assess the level of Hierarchy the CIOs have in the Organization | BF01,BF02,BF03,BF08, |
| | SP2: To identify the gap between CIOs role in exercising their role and expectations from the Business Organization | MF01,MF02,MF03,MF04,MF05 |
| | | KIO01,KIO02,KIO05 |
| | | CRR01,CRR02,CRR03,CRR07 |
| RQ2: What is the Short and Long term Vision of CIOs in the Business? | Sp4: To identify the critical contribution of CIOs for the business in time difference | DD8, |
| | | BF01,BF02,BF04,BF5,BF6,BF7,BF08,BF09 |
| | | OE01,OE02, |
| | | KIO03 and KIO05 |
| | | MF06,MF07,MF08,MF09,MF10 |
| | | CRR02,CRR03,CRR04,CRR06,CRR07,CRR09,CRR10 |
| RQ3: What is the Difference in Changing role of IS Managers between Public and Private Organizations? | SP3:To identify the difference in Changing role of CIOs between public and Private organizations | DD1, |
| | | BF7,BF08,BF09 |
| | | MF01,MF02,MF03,MF04,MF05 |
| | | KIO03,KIO04, |
| | | CRR05,CRR06,CRR07,CRR09 and CRR10 |

**Key: The meaning of the Abbreviations used**

RQ: Research Question

SP: Specific Objective

DD: Demographic Data

BF: Basic Function

MF: Maturity Function

OE: Open Ended

KIO: Key Informant Organization

CRR: Critical Role and Responsibilities

## 3.4. Data Analysis Techniques and Procedures

The changing role of IS managers is affected by CIO's level of hierarchy in the organization, the availability of IS services and infrastructure in the organization, level of maturity and centralization of IT services. After organizing the questionnaire response and the interview data with respect to these variables, the quantitative result is edited, structured and analyzed using the SPSS data analyzing tool based on the convenient statistical method. In the mean time the data pre-processing like screening of some invalid questionnaire responses done before the data is used for analysis. And then the descriptive statistical methods like frequency distribution, mean calculation, and graphical representations are used to summarize the result of the collected data. Furthermore, the analysis of the resulting data is done based on the frequency and the percentage of the related concept.

Qualitative data is presented in a narrative form. Basically the interview has about ten questions as shown in Appendix V and result is categorized in to three. First, the basic information about the interviewees (educational background, experience and managerial role practice) and their respective organizations IT capabilities and competencies responses are coded. Second, responses in their role and responsibilities as per their daily schedule, their position in the organization's structure are documented. Finally, the change perception of CIOs in the past and in the upcoming periods from the world trend as well as the Ethiopian context reflection is coded.

## 3.5. Validity and Reliability of the Research

The quality of the research is ensured through pilot study and other standards for validity and reliability as discussed below.

### 3.5.1. Pilot Study

The pilot study was conducted on a sample of ten purposively selected respondents to test the validity and reliability of the questionnaire used. Among the ten samples used for pilot testing, all of them have responded which resulted in 100% response rate. Moreover the pilot test has helped the researcher to ensure the convenience of the questionnaire distributing mechanisms used and found that using all options brought better result.

Two of the pilot study sample taken has commented on the online form set to be required. After making discussions, the questionnaire items were edited to let the respondents answer partially or all of the items.

Furthermore, to measure the internal consistency of the questionnaire items, reliability test was conducted. Accordingly, the Cronbach's coefficient alpha was used as a reliability criterion with the aid of SPSS software tool. According to [32], Cronbach's alpha was used as a reliability check which is normally range between 0 and 1.The closer the coefficient to 1.0 the better the internal consistency of the items in the scale used. George and Mallery (2003) as cited in [32] provided the rule as:' _>0.9-Excellent, _>0.8-Good, _>0.7-Acceptable, _>0.6-Questionable, _>0.5-Poor and _<0.5-Unacceptable'. The researcher has checked the reliability test of each theme and got 0.803 and 0.727 for the themes grouped in basic function and maturity functions respectively. The combined themes Cronbach's alpha value shows 0.75. Hence, this Cronbach's alpha value, 0.75, is above the minimal alpha value that proves the internal consistency and reliability as seen in Table 5 which should be greater than 0.7 as discussed in [32].

**Table 5: Reliability statistics based on the pilot test data**

| Cronbach's Alpha value of themes used in the Survey | | |
|---|---|---|
| **Description of themes** | No of Items used | Cronbach's Alpha value |
| **Basic Function** | 10 | 0.807 |
| **Maturity of Functions** | 10 | 0.727 |
| **Combination of Both themes** | 20 | 0.750 |

Source: Own Survey, 2016

### 3.5.2. Reliability of the research

Reliability definition by Joppe (2000) as cited in [33], stated as '*…the extent to which results are consistent over time and an accurate representation of the total population under study is referred to as reliability and if the results of a study can be reproduced under a similar methodology, then the research instrument is considered to be reliable'* shows the proper selection of representative sample leads repeatability of results or outcome. Hence, this study has attempted to identify sample (IS/IT managers, Directors and/or team leaders who are working closely with the manager), the researcher believes are appropriate enough, using the purposive sampling and quantitative options is also used to get reliable enough result.

As discussed in [27], reliability of the research can be checked by analyzing things like sources of the data, data collection mechanisms, biases if any and level of accuracy. Since the data is collected by the researcher, the source of the information is properly selected using purposive sampling to avoid irrelevant responses; interview and questionnaire for the selected individuals are found appropriate for the survey; the researcher has conducted the interview and managed the questionnaire to avoid any possible biases to the objective of the study and errors happening during the process, the reliability problems controlled to be low. Although, as indicated in [27], reliability contributes for the validity it doesn't guarantee to have valid result. In relation to ensure validity Pathon (2001) discussed as cited in [33], '*triangulation strengthens a study by combining methods. This can mean using several kinds of methods or data, including both quantitative and qualitative approaches.*' Hence, the validity of this survey research is maintained by using the combination of quantitative and qualitative methods.

# Chapter Four
# Data Presentation and Discussion

## 4.1. Overview

In this chapter data obtained from different sources are presented and analyzed based on the specific objectives set and the prior related work findings. The first section explains the demographic data and related findings while the second section expresses findings on changing roles of IT managers and the third section discussion is about the qualitative and quantitative results in light of the research question this research aimed to answer. In the demographic data and related findings section; characteristics of respondents, sector and size of the business organization, basic operations and service maturity and their role and level of reporting in their organizational structure are discussed. In the findings on changing roles of IT managers section, changing perception of IT managers and focus of IT managers are presented based on the data obtained questionnaire and interview. Furthermore, the result is discussed using triangulation validation mechanisms of the quantitative and qualitative analysis results obtained.

## 4.2. Demographic data and related findings

The survey questionnaire gathered demographic and related data that may have relationship with the role of the CIO/Manager in the business. The demographic data comprises of question like the sector of the organization's business, employee size of the organization, gender and age of respondent, work experience on the managerial position, the level of decision power and role that best fits to their role. This section of the chapter discussed the characteristics of the respondents in the sample.

The interviewees of this study have been asked concerning the educational background to get the influence of their educational background to their managerial role and found all have IT only (except one has also diploma in business) background indicating technical with more than five years on the position.

### 4.2.1. Distribution of Respondents by Sector

The resulted data in relation to the distribution of the respondents by sector is shown in the figure 4. The sample size is 60 taking four organizations per sector and three respondents from each organization (considering the Director/Manager, the application and/or infrastructure team leaders). Even though the sample size in this survey looks small, survey researches in [8] took 25

of whom 20(80% response rate) and [17] took 283 of whom 62(22% response rate) have responded the questionnaire. Research in [22] also indicated getting low response rate from IS top management is not unexpected. However, this survey has used interview on top of the questionnaire for the qualitative data which makes it different from both. Actual number of respondents in this survey is 43 which is 72% (response rate) of the total, of whom 4 of them discarded due to the incomplete and some garbage value contained, resulting 39 for analysis. Accordingly the respondents per sector are 36% from Government, 21% each from Education and insurance, banking 18% and finance and Manufacturing each 15%. This indicates at least 15% of the population in the sample from each sector has responded the questionnaire.

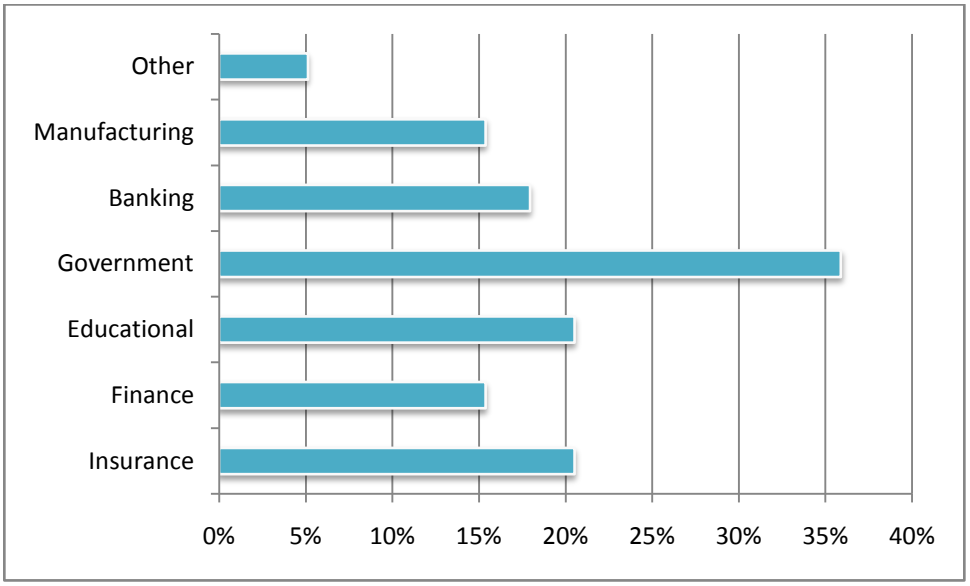


**Figure 4: Distribution of Respondents by Sector Own Survey (2016)**

The respondents were asked to select the options that best fit for their organizational sector (manufacturing, Banking, Educational, Finance and Insurance) is either Government or private. As a result the response for the Government looks high as can be seen from Figure 4.

### 4.2.2. Distribution of Respondents by Gender

The distribution of respondents with respect to gender is depicted in figure 5. Even though the data shows the majority of respondents are male, females are also coming to such high technology oriented management area. Moreover, this survey incorporates all professionals irrespective of gender.

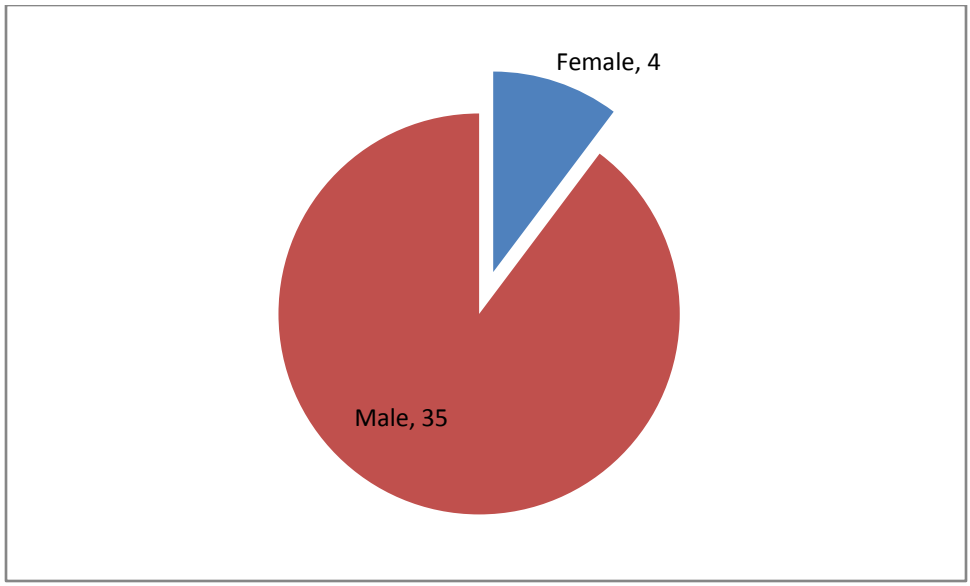


**Figure 5: Distribution of Respondents by Gender Own Survey (2016)**

Unlike to other researchers work [2] and [15], this study has tried to investigate the involvement of females in such high technology enabled executive management role. The result shows, the females' participation in the technology are seen but too small which needs more work from all stakeholders (Government, Organizations, females themselves and others) to increase the number. A research in [35] also indicated that "*although women have gained increased access to supervisory and middle management positions, they remain quite rare as elite leaders and top executives."* Further research can also be done in the area to investigate factors affecting the females' participation in such high executive role.

### 4.2.3. Age Distribution of Respondents

The age distributions of respondents who are at this position are depicted in figure 6. This indicates that the majority 72% of IT managers are in the age group 30-39 followed by age group of 40-49. This indicates that they are in the active working age group.

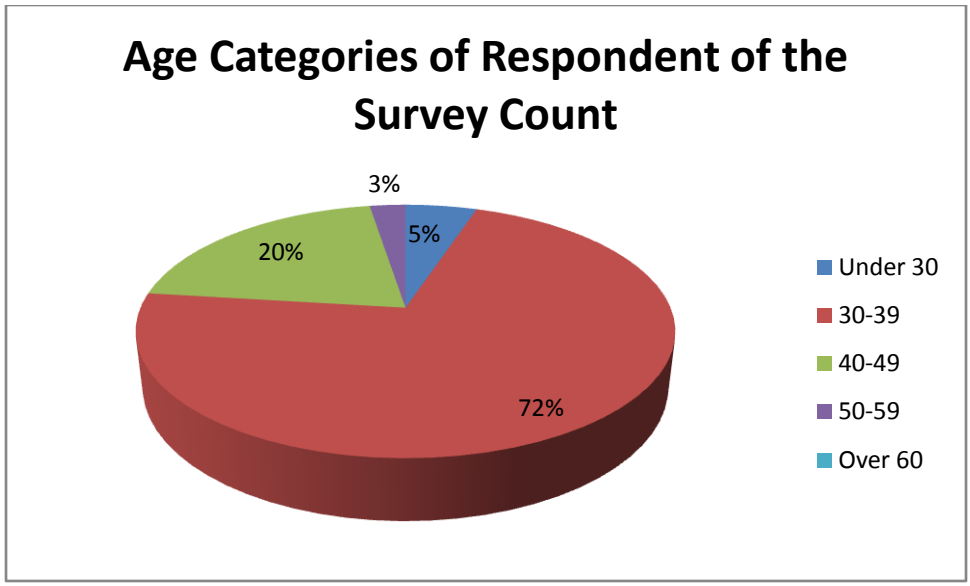


**Figure 6: Age Distribution of Respondents Own Survey(2016)**

As can be observed, age distributions of respondents show the reality in Ethiopian context that the IT profession coming to practice during the last twenty years or less.

Although this research didn't attempt to get age information about the Chief Executive Officers(CEOs) of organizations(CEOs are not part of this study), we all know that the managers (business managers) of organizations are those who have long service years unlike to the younger IT managers (as can be seen in Fig. 6). The idea that supports this is the responses of interview for the question" *What are the key challenges for managing IT at your organization?* ".

One of the interviewee explained this saying:

> *"… I am the only looks younger and have less experience in the management team. They are all having long service years in this organization and somewhere else. They fear the cost and do not have trust on the result of Projects…."*

Hence, the age difference among the management team members together with the gap in the technology literacy is one of the factors affecting the IT management in Ethiopian context.

### 4.2.4. Distribution of Reporting level in their Organizational Structure

One of the factors affecting the role of IT managers (CIO) as cited in [5] shows is the CIOs hierarchical level (reporting level). In relation to this, this survey has shown strong attempt to directly get response from the IT managers. Thus, based on their answer for the question *"Whom*

*you are reporting to in your organizational structure?( indicate the level of the organizational structure)"* their answer shows that they are reporting to either CEO, General Manager, Managing Director or President of their respective organization. They are asked to write the name of whom they report and to indicate the level of the hierarchy in their respective organization, their response shows that organizations have different naming options for the higher decision maker of the organization. However, the IT Directors or Managers are reporting to the top official of their respective organization. But this directors or managers (16 of the 20 directors or managers in the sample) respond the question "*Are you member of the top management team (TMT) of your organization?*" 12 of them answered "Yes" and the remaining 4 of them answered "No". This indicates not all reporting to the top management body are actively involving in the top management team for the decision making process of the respective organization.

### 4.2.5. Distribution of Respondents by Service Year

The number of years the respondents have worked on their current position is depicted in the Table 6. The result shows that 49% of them have service year of 5-9 followed by 10-15 years of service is 26% of the respondents.

**Table 6: Distribution of respondents by service year (Own survey 2016)**

| Service Year | Frequency | Percent |
|---|---|---|
| Below 5 | 8 | 20.51 |
| 5 to 9 | 19 | 48.72 |
| 10 to 15 | 10 | 25.64 |
| 16-20 | 2 | 5.13 |
| Over 20 | 0 | 0.00 |

The absence of IT managers with service year over 20 (as shown in Table 6) strengthens the idea discussed in section 4.2.3 that difference in age and service year together with the gap in technology knowledge area of the business managers demand lots of effort from the CIO to outshine the role.

### 4.2.6. Practice of the Managerial Role

The survey asked respondents to indicate the role that best fit to their management practice of the identified six managerial roles [5]. The response indicates that the majorities of respondents are exercising the leader and monitor role followed by resource allocator as shown in the table 7.

**Table 7: Practice of the Managerial Role (Own Survey, 2016)**

| Roles | Frequency |
|---|---|
| Leader | 35 |
| Liaison | 2 |
| Monitor | 20 |
| Spokesman | 2 |
| Entrepreneur | 2 |
| Resource Allocator | 10 |
| Other | 2 |

A research in [2] classifies the IT managerial roles as internal to IS department, within the organization (intra) or across organizational (inter-organizational). As reported in same paper, based on the decision locations, communication and information flows (see fig 1.) the leader and resource allocator as internal to IS and the rest four roles (Spokesman, Entrepreneur, Liaison and Monitor) as interaction between the intra and inter-organizational environments.

Hence, the result of managerial role practice shown in table 7 indicates that the CIOs/IT managers are mostly focusing on the improvement of the IT department with little effort in inter-organizational context whereas almost none at intra-organizational aspect as can be compared result of this table 7 with figure 2. However, the interviewee respondents indicated they practice all with major focus on leader and monitoring role.

## 4.3. Findings on Changing Roles of IT managers

### 4.3.1. Perception of Change in IT Managers Role

Through this research the changing perception of IT managers' role was investigated through items asking about their reporting level, their devotion on strategic tasks, engagement on data center and infrastructure development and maturity level of IT services.

Based on the collected data on the manager's level of hierarchy, the result indicates that 16 of them report to the 1st level while the 23 report to the 2nd and below in their respective organizational Structure. This quantitative result shows that the IT managers are coming to the highest decision making level. However, one interview respondent said that

> *"… although I am reporting to the CEO, as equally to other business section directors, he (CEO) takes the consensus of the whole management team as they focus on the cost, not the benefit. I have equal vote to other directors. It is only when I am at a higher level to them that I can enforce to accept my idea."*

This response indicates that although the CIOs are reporting to the top management of the organization, they remain to be empowered against their colleagues. Similar researches in [24] also indicated that the formal authority the CIOs have in the organization the better to be accepted and their work facilitated. They also suggested using informal influence in the absence of formal authority by creating good relationship with the organization's members.

Parallel to their reporting level, CIOs answered the question whether they are member of the top management team of their respective organization or not. Almost all (75% of them) confirmed that they are member of the top management team. An interviewee from Government finance sector IT director commented on his involvement role as:

> *"… though I am the member of the management body of this organization like other business section directors reporting to the general manager, we simply implement, administer and give support on all IT systems and infrastructure that are implemented centrally at the federal level. Even if we plan new systems and technology or comment the drawback of the current system to the benefit of our organization, the manager will not allow…"*

Similarly, another interviewee from a private bank IT manager explained this by saying:

> *"… Though it is not in our bank (it is five years old), we see that IT managers are coming to the vice president level. In a banking sector, no IT means no service. Every time the manager expects me propose new way of doing to our context. But the challenge comes from our colleague as they have equal vote to me."*

A research in [23] agrees that the CIO should function as "executive" rather than as a functional manager indicating the IT managers/CIOs need to be appointed as higher decision makers. CIOs with higher authority in the organization are more accepted by the subordinates and peers in the management team. In the situations where CIOs lack formal authority, they should use the influence mechanisms by showing them their contribution and the advantage [24]. One research by Fiegener and Coakey(1995) as cited in [24], said the '*CIOs hesitance to exert influence may increase the risks that the agenda for IS will be shaped by other, less knowledgeable sources.*' Hence, CIOs need to struggle in the absence of the formal authority.

Even though the researcher of this study couldn't get any related work telling as when CIO assignment started in Ethiopian context, literatures show that CIO role first introduced in 1981as cited in [26].

In relation to getting the change evolution of IT managers/CIOs role in Ethiopian context, this research has asked both in questionnaire and interview that "*has the role and level of the CIO/IT Manager changed over the past years*..." The majority of respondents have agreed that change has been seen. An interviewee from a Government higher education sector agreed this by saying:

> *"… to see the existence of change in this country one can see the history of the Ministry of Information and Communication Technology(MCIT) the former Information Communication and Technology Development Agency(ICTDA) and establishment of Information Security Agency(INSA). "*

The other reason the same person has cited is:

> *" …the organizations commitment to include IT structure in their respective organizational structure from a support expert to the department level is an indication for the change."*

Another respondent, from other government higher education, explained the existence of the change as:

> *"…Our directorate was called ICT and Library before 3 years and the staff was more than 100 for library and around 14 ICT Staff. But, now Library has its own directorate and ICT also has its directorate with 92 staff members and 5 departments*

*(Teams). Before, ICT directorate was managed only by the director but now with the new ICT structure there are 5 team leaders who are responsible to control all the activity for each team (department) in addition to the director. So, there is cascading of strategies comparing with the structure which was before 3 years. That is why the role of manager (Director and Team Leaders in our case) was changed before 3 years."*

Another respondent who used to work as CIO of national bank of Ethiopia has answered this question by saying:

*"…Changes is inevitable, the role of CIO in the older time was focusing on acquiring and administrating the IT Resources (Hardware and Software) now CIOs are also responsible for IT and Business alignment. They are becoming part of Business decision making. Now CIOs are responsible for Hardware, Software, Process redefining/reengineering, and strategy …"*

All the result discussed above can infer the progress in the IT usage and the recognition of the IT managers in the economy of the country. The emerging of the ministry and the information security agency by itself is an indication, as one of the interviewees cited. Organizations incorporation of the IT department in their organizational structure as a department and creation of the CIO role is also another sign of change.

In relation to the short and long term vision of CIOs in the business, the Survey instrument has asked respondents *"… Will the role of the CIO Change over the coming years?"* Most of the respondents argue that there will be change but their justification varies from sector to sector and between private and public organizations.

The Government sector organizations look for the direction from the center (Federal level or ministry level) and are seem restricted in implementing any IT services. One of the interviewees from a Government finance sector has indicated that:

*"…though the technology demand and improvement is there, the change in Ethiopian context will happen based on the Government commitment not by the competition in the market. If it were as per the competition in the market, we would have done a*

*lot…. I hope the change started in few services (Custom services example: Tax Identification Number is must for any business work to start) will continue and the IT Director's role also will get more chance provided that the Government commitment is there in IT usage."*

In relation to the change of the CIOs/managers role a research [23] shows they should involve in the strategic development not on operational and the technical part. This should be reflected at all levels from a single organization to the country level. CIO's involvement in the country wise strategic initiative can improve the situation and let the Government to use the benefit and resource from the sector.

As organizations IT service maturity difference is normal, well organized and relatively matured organizations CIOs give emphasis on the return from the investment and creating competitive advantage for organizations. One of the respondents from a banking industry has explained this by stating:

*"…the Information Technology (IT) which was seen as cost center now becomes strategic partner. The Chief Information officer (CIO) changed into Chief Innovation Officer (CIO) and CIO used to side to Technology related meetings, now to a center of Business meetings. As we are now in a major digital disruption era, CEO may act like a CIO."*

For an organization to have a competitive advantage from the IT services, strategic aligning of the IT with the business is basic so that the IT strategies take in to consideration future business strategies. Such IT capabilities are highly associated with IT management skill of the CIOs. A research in [21] recommends that a manager who is competent in IT also requires having business knowledge. The idea is CIOs need to have both technical and business knowledge so that they can build better IT/business alignment.

The interview result aligns with this quantitative result. One of the interviewees from banking sector has explained the change as:

*" … since we have seen the trend changing(in IT) from being cost center to strategic partner, from support to core business area I expect that the future CEOs of companies will be from IT profession…."*

Polansky et.al (2004) as cited in [26] enumerates the future role of CIOs in the business as" *increasing importance on governance will require the CIO to develop a deeper understanding and intuitive grasp of corporate finance and accounting processes."* Another research in [8] strongly emphasized that understanding the technology by CIO is not enough rather he/she must be a "general business" oriented manager having considerable political, organizational, and communication skills. Hence, the knowledge on both the technical and business will make the future CEOs from IT or the CEOs will be required to have such strong IT capabilities.

### 4.3.2. Focus of IT Managers in the Business

As one of the purpose of this survey is to identify the strategic focus of CIOs and identify the difference of the CIO role practice in the public and private organizations, respondents were asked to rate the importance of tasks that are related to their daily job as seen on the table 8. Some of the issues that affect CIOs role as cited in [5] are the understanding difference in the managerial roles based on the functional areas, the time allocation for most appropriate role. CIOs are advised to concentrate on the strategic and long term plan by sharing the operation work for subordinates. On the other hand [2] advises that CIOs should view IT as a means to enhance the organizational effectiveness not as an end itself. The availability of the services, the technical background of the CIO and strategic involvement of IT in the organization will affect the focus of the CIO.

**Table 8: Quantitative Result on Basic Function theme (Own Survey, 2016)**

| Code | Items | Not important | Slightly Important | Moderately Important | Neutral | Important | Very Important | Extremely Important |
|---|---|---|---|---|---|---|---|---|
| BF01 | Importance of Allocating Equipment or Materials | 1 | | 4 | 2 | 2 | 9 | 21 |
| BF02 | Importance of Gathering Information about customers, Competitors, Associates, etc. | | | | 5 | 11 | 6 | 17 |
| BF03 | Importance of Serving as an expert to people outside of the department | | | 4 | 4 | 5 | 12 | 14 |
| BF04 | Importance of Focusing on the improvement of the Organizational IT infrastructure and data center issues | | | 2 | 2 | 2 | 6 | 27 |
| BF05 | Importance of Keeping up with Technological Developments related to Organization Business | | | | | 5 | 8 | 26 |
| BF06 | Importance of Attending conferences and meeting to communicate organization's Strategy | | 1 | 3 | 1 | 1 | 13 | 20 |
| BF07 | Importance of Keeping track of Staffs/Subordinates in Daily routine | 1 | | 5 | 2 | 4 | 11 | 16 |
| BF08 | Importance of Participating in the Organizational Strategic plan Development | 1 | | 3 | 2 | 3 | 9 | 21 |
| BF09 | Importance of keeping up with the purchase/adoption of new Technology to the Business Organization | | 1 | | 4 | 3 | 12 | 19 |
| BF10 | Importance of Attending Trainings and forums to increase the knowledge of the Organization Business | | | | 3 | 1 | 15 | 20 |

The rate of "*Importance of Focusing on the improvement of the Organizational IT infrastructure and data center issues*" is about 15% and 69% of respondents as "Very Important" and "Extremely Important" respectively. Similarly, "Importance of Participating in the Organizational Strategic plan Development" is rated at 23% and 54% of the respondents as "Very Important" and "Extremely Important." Though the questionnaire result seems that the managers are almost equally dedicated to the infrastructure and data center development, involving in strategic development and giving support at the same time which is not acceptable, as the CIO get focus on the strategic part the routine task is expected to shift, the researcher has counterchecked this and get the idea that supports this as one of the interviewee described:

> *"… I am mostly occupied on the support request from different working departments during the day hour and we have data center development project that we are focusing on, I usually get time for the strategic thinking while am on bench marking visit. The support request doesn't give us time for such option. Our organization ICT infrastructure and service is not that much matured as the age of the organization. "*

In relation to the role and responsibilities of CIOs daily schedule respondents were asked that *"What do you actually do, i.e how do you spend your time?"*, the majority of their time devotion indicates attending meeting, responding letters from functional units, giving direction for subordinates , responding e-mails and fixing issues on system. Few of them have indicated that they devote their time for designing new IT functionalities and services. However, almost all have cited the existence of routine tasks (support, meeting and process follow up) as a challenge for their work.

Although the availability of IS services and infrastructure affect the changing role of the CIOs, focusing on the strategic issues by authorizing or passing common issues to their subordinates with follow-up creates an advantage.

### 4.3.3. IT Service Maturity

Among the objectives of this research, identifying the impact of IT services maturity in the CIO role and contribution for the business is assessed through items listed in the “maturity function” theme. The quantitative results of the collected data are listed in the table 9. A research as discussed in [2] argued that the IS service maturity changes the managerial roles of a CIO. The entrepreneur role plays a greater role in influencing overall strategy and planning in the organization and translates these organizational strategies and plans into definitive IS actions. As IS matures, the entrepreneur, monitor, and spokesman roles of CIO becomes very important. Similarly, as in [8] IS centralization level affects spokesman, resource allocator and liaison roles of CIO.

**Table 9: Quantitative Result on Maturity theme (Own Survey, 2016)**

| Code | Item | Not At All | Very Small Extent | Small Extent | Moderate Extent | Fairly Great Extent | Great Extent | Very Great Extent |
|---|---|---|---|---|---|---|---|---|
| MF1 | Extent of information system planning link with organizational strategic planning | | | 1 | 1 | 18 | 3 | 16 |
| MF2 | Extent of Information system use for creating competitive advantage in the organization | | | 1 | 4 | 7 | 14 | 13 |
| MF3 | Extent of Information Technology Distribution in the organization | 8 | 1 | 3 | 5 | 4 | 10 | 8 |
| MF4 | Extent of the Organizational units or functions to create and develop their own system | 15 | 4 | 4 | 4 | 5 | 6 | 1 |
| MF5 | Extent of Information System Support personnel Centralization in the organization | | 2 | 2 | 5 | 8 | 5 | 17 |
| MF6 | Extent of Information System Department responsibility for performing System Analysis | 3 | | 1 | 2 | 3 | 7 | 23 |
| MF7 | Extent of Information System Department responsibility for performing System Design | 3 | | | 4 | 1 | 7 | 24 |
| MF8 | Extent of Information System Department responsibility for making policies with regard to IT usage | 2 | 2 | | 3 | 3 | 7 | 22 |
| MF9 | Extent of Information System Department responsibility for performing Information System Planning | 4 | | 3 | | 5 | 9 | 18 |
| MF10 | Extent of the IT department role in the Organization Business | | | | 1 | 2 | 9 | 27 |

The questionnaire item MF10 (*Extent of IT department role in the organization business*) as shown in table 8 is rated high by more than 90% of respondents indicating that the IT is becoming enabler of business. The interview result also indicate, although not all organizations business are strongly linked with IT as finance sectors, organizations are having businesses that rely on the information technology services. One interviewee from a Government finance sector has discussed as:

> *"… Although IT is functioning at a directorate level in our organization it is treated as a support not core. But in reality no IT means no work at all. We can see this when system interruption occurs or power fail. …."*

Another interviewee from a Government higher education has also stressed this by saying:

> *"….in principle we(IT department) are considered as enabler and are working to enhance the efficiency of service delivery systems like registration, library ,communication and others. But I (Director) have lots of challenges to facilitate payment order for consultants, item purchase or maintenance issues and I waste my time tracing all step by step. This is because of the old working culture and the process is manual."*

The result MF04 (*Extent of the Organizational units or functions to create and develop their own system*) as shown in table 9 is rated as "Not at All" by 38% of respondents while others rated somewhat "moderate Extent" indicating the business organizations are expecting all from the IT Department and the IT manager has great role in proposing and implementing systems for the business. On the other hand MF2 (*Extent of Information system use for creating competitive advantage in the organization*) as shown in table 9 is rated as "Great Extent" by 36% of respondents and "Very Great Extent" by 33% of respondents depicting the IT solutions are becoming a competitive advantage for organizations to provide their services.

Regarding the information system use for creating competitive advantage and organizational units' readiness to develop their own IT systems, an interviewee from a bank said that:

> *"… Every time we (IT department) are expected to create new IT system and technology to avail new bank services. Currently, every bank is competing to attract customers. I will investigate and discuss with my team (IT staffs) every directives (banking directives are given centrally) coming from the national bank of Ethiopia. "*

But the Government offices are challenged with scarcity of professionals to automate business processes and give support for all. One of the interviewee from the higher education institution indicated that:

> *"… although there are lot requests and gaps I see in our university that need to be automated, the lack of competent IT professionals and presence of high turnover due to the payment, is challenging me. I have 47 vacant positions right now. As a result I am enforced to give a lot support with few experts for the business units."*

The CIO seems engaged in the routine tasks unlike to other counterparts who are working for getting the competitive advantage of their services and infrastructures. It requires the organizations to engage the CIOs for long term plans to be competent in this dynamic technology dominant environment. Even though majority of organizations are using IT as a competitive advantage for their organization, there are still few indications that IT usage is not seen as competitive advantage.

### 4.3.4. CIOs involvement in Organizational Strategic Planning

In relation to understanding the CIOs involvement in the organizational strategic planning, this survey put questions in the questionnaire and interview.

The respondents for MF1 (*Extent of information system planning link with organizational strategic planning*) as shown in table 9 is rated by 46 % as "Fairly Great Extent" and about 48% "Great Extent" and "Very Great Extent" showing the two(information system planning and Organizational strategic planning) are somehow aligned.

However, the interview result shows that the practice of participation in organizational strategic planning is not fully operational or uniform. But a research in [21] indicate IT management, similar to other business streams needs vision and goal setting, allocation of resources and monitoring of progress. The strategic IT planning as in [13] is the driver of the business activities in the organizations. It should be done in collaboration with the IT and business people so that it meets the organization's vision. An interviewee from a bank sector explaining the trend they prepare the strategic plan said that:

> *"…we give input for the organizational strategic plan development team which is external (out sourced) and we plan ours (IT plan) based on that. The external team is all from the business and management knowledge area."*

For the organization, to get a competitive advantage from the IT services the strategic plan should involve the CIO and business managers so that they contribute their vision and work together to make it real. The responsibility of getting the exact "competitive advantage" of the ICT investment challenges of an organization is the responsibility of the CIO as in [17] but making the organization technologically competitive should be responsibility of every member of the management team and the organization as a whole.

The other interviewee also responded the question (*Are you actively involving in the strategic plan development of your organization?*) by saying:

> *"… though there are some discontinuity by the top management involving us (ICT) in the process, we have requested to involve and did the current five year strategic plan."*

As cited in [23], one of the factors the senior executive member (CIO) uses to bridge the gap between information technology unit and strategic objective of the business is participation in strategic meetings. The more he/she participates and contributes for the strategic plan the more he/she becomes influential and have acceptance to implement the required IT service or technology in the business

### 4.3.5. CIOs effort in getting business knowledge

The CIOs effort in acquiring the business knowledge and appropriate technology was examined by this survey. One of the broad technical and organizational scope responsibilities of the CIO as cited in [17] is IT-Business alignment which requires the knowledge both in IT and the business. Although it is difficult to get CIOs who have both the IT and Business knowledge, it is must for IT background CIOs to get at least the basic knowledge of the business so that they can easily understand the requirement of the business units and even the CEO.

In relation to identifying the CIOs effort in getting the business knowledge, this survey has asked questions BF09 and BF10 (*"Importance of keeping up with the purchase/adoption of new Technology to the Business Organization"* and *"Importance of Attending Trainings and forums to increase the knowledge of the Organization Business"*) to get the actual practice or experience in getting the business knowledge. Responses of respondents are shown in Table 8. Accordingly, more than 75% of respondents' rate for both BF09 and BF10 as "Very Important" and "Extremely Important" indicating IT managers are investing their time in getting the business

knowledge parallel to the knowledge on the technology. An interviewee from a bank sector also strengthens this as:

> *"... I have worked more than ten years in the bank at different position. I used to work for about six month non IT (business) tasks before I assigned for my entitled IT job. Even now when we recruit new employees we give training on the bank business and let them free from IT works to practice every tasks for almost a year so that they know the business. ....I myself take trainings and workshops on banking that makes me understand the business. I can easily explain my view and understand our business managers and the CEO's concern in the management team meetings."*

On the other hand, one interviewee described his practice saying: *"... I wish I could get the business knowledge to be full, but I am so far working for the industry standard IT certification trainings like Microsoft and Cisco."*

The trend of the CIO role indicates functioning and integrating with the organization team that needs the managerial skills not purely technical expertise. A research in Polansky et.al(2004) as discussed in [26] *"responsibilities will continue to shift from technical/operational to a strategic/management focus."* Hence, acquiring both the technical and business knowledge together with the managerial skills will make the future CIOs more competent in the business for both CIO and CEO roles.

### 4.4. Discussion

This section discusses the findings of the quantitative and qualitative results in light of research questions that this research aimed to answer. The first research question raised was "*How the decision power of IT/IS Managers is changing in the organization?*"

The highest decision making body of the IT department has various naming for different organizations like ICT Director, Manager, ISM Director, Leader, CIO and Vice manager are few to site.

Research findings as discussed in [8], shows similar result on the decision power of the chief Information officer (CIO) and where to focus on (whether on strategic issues or technology part) and what mechanism to use in making effective contribution for the business. The trend also shows that CIO role is changing. According to this research [8] the change is more competitive in the business environment, harsher, rapidly evolving technology and increasingly knowledge

demanding that requires CIOs to work more in change driven championship. Gottschalk (1999) as cited in [17], CIOs are "*the coach who trains people to acquire the skill sets they will need for the future.*"

This survey has got similar result in which majority of IT managers are reporting to the highest level of the management. However, majority of the organizations participating in this survey have indicated that the reporting level doesn't guarantee the power in making difference on the business. It needs to have an influential power to implement the technology in the business. As demographic result on the age of IT managers of this survey indicated (see Fig. 6), 72% of them are in the range 30-39 and 20% are in 40-49. Though this research didn't verify the age of the CEOs and other business functional managers of organizations (further research can be done on influence of the age difference of business managers in the business organizations), the researcher has observed this difference is cited as one of the major problem for IT managers to implement new IT technology and systems in the organizations. The other point that this research couldn't get evidence on, but is cited by interviewees, is the exact period of time the information technology is introduced to the Ethiopian business organizations and the profession got policy direction in using the information technology to support organizations business.

The involvement of IT in Ethiopian business organizations context, ranges from simple support (how to use IT related materials and systems) work to functional dependence (Automating the business processes and functionalities). Unlike to the developed nation's business organizations, some of our organizations are still on the infrastructure and service developments. As a result most of the IT managers' are focusing on managing this projects, giving support and persuasion tasks in convincing the management for all costs/budget required and the benefit that is expected from the investment. Although this survey has selected the sample taking the existence of IT infrastructure and services supporting the business that have IT professionals at a department level, participants have indicated that the Ethiopian IT/IS Managers involvement in the organizations business emanates from giving the routine IT support( by single expert) to the critical business influential ( at department level) stage.

Even though the organizations readiness in IT service delivery and functional dependency of businesses shows variations from sector to sector, between public and private organizations the reporting level of the managers are coming to the top decision makers (1st level or 2nd level) of

the organizations. However, it remains to magnify their strategic impact for the business organizations.

A research in [25] argues that the organization's CIO reporting structure should be governed by the organization's strategic positioning but should be to the C-level executive.

The second research question that this research intended to answer was "*What is the short and long term vision of CIOs or IT/IS managers in the business?"*

The vision (short and long term plan) of IT/IS managers in contributing their professional impact for the business depends on a number of factors (which is not the focus of this research) but the researcher believe it can be influenced by the existing infrastructure, available IT services, the autonomy in the organization (as discussed in the above section), organizational readiness and the policy direction.

This survey has explored the strategic involvement, change perception and readiness of IT managers in the business. The result shows that managers are investing their time in learning the business (get the domain knowledge) so that they create an opportunity for the organization by applying their technology knowledge unlike to the business people. These IT managers are learning that future competition for the CIO position will require mandatory both the business and the technology knowledge.

Some IT managers/directors are starting to influence their bosses to involve them in the strategic development team. This involvement is giving them the chance to get the required attention and budget to buy relevant technology and services for the organization.

The other important thing this research has noticed is that IT managers believe by acquiring the business knowledge, technical knowledge and political power, they should compete for the top management level (CEO) of the organization so that the business is supported by the technology and have competent organizations.

However, the concerns of some IT managers are still focusing on the data center and infrastructure development, mastering their technology area knowledge and expecting the Government policy enforcement. Since the managers working environment (level of IT services

and organizational readiness's) has variation, this research couldn't clearly identify the short and long term visions of the managers.

The third research question was **"***What is the difference in changing role of IT/IS managers between public and private organizations?*

The public and private organizations have differences in type of service they deliver, business they run, infrastructure to deliver the technology and the financial capacity they have. As a result, the IT service maturity level and available infrastructure creates variation on the IT Managers. Research in [2], shows the executive roles of IT managers are affected by information system maturity and the degree of information systems centralization.

Although the survey sample includes both private and public organizations and the questionnaire item DD1 ("*please indicate the sector of your organization's business…*") requests to indicate their sector and whether they are from public or private, the researcher has found that respondents select the option indicating the sector only but failed to indicate whether they are from public or private organization.

However, during the interview period of this study, two of the interviewees from public organizations were seen busy at the datacenter and infrastructure upgrade while some of the interviewees from private organizations were working on systems (Software projects) with their software dealers. The result from public sector indicates that IT managers are focusing on infrastructure improvement and service stability to make it smooth. On the other hand the private organizations IT managers are focusing on improving service delivery and cost minimization. Similarly, this difference is seen between private and public banking sector organizations competing to bring new IT enabled business service.

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# Chapter Five
# Conclusion, Recommendation and Limitations of the Work

## 5.1. Conclusion

The purpose of this research is to assess the changing role of the IT/IS managers in their respective business. More specifically, assessing IS services maturity level impact on the CIO role, identify the gap between the actual practice of CIOs and the business practice, assess the difference between the public and private organizations in CIO role, assess the level of hierarchy in the organizational structure and see their critical contribution for the business.

Although the Information technology is expected to lead the business as seen in the developed nations, it looks impractical in Ethiopian context. This study reveals that the IT services maturity level, which is relatively low and not uniform, affects most IT managers to focus on the routine task and infrastructure development. While some IT Managers are working in the strategic team of the organization some are seen participating (give the required input from outside without involving) in the team with little effort. However, the IT managers/CIOs involvement in the organizations strategic plan development is a matter of survival for both the organizations and CIOs. Organization that does not inculcate IT in the strategy of the business, it will suffer from the competition and resulted in failure. Similarly, CIO, who has no experience and knowledge in strategy development of business by integrating with IT will be challenged more.

The roles of the managers in private and public organizations have shown differences among IT managers. Some Public organizations IT managers are engaged in automation and giving support for business functions where as the private organizations IT managers are working for making the profitability of the business. However, the public and private banks IT managers are working for the improvement of the service delivery and making the business profitability.

This study has also investigated the level of the organizational hierarchy at which the IT managers are reporting for and IT managers are seen reporting to the most top level or one level less of the highest management body of the organizations. But they are not empowered in decision making process of the organizations. IT managers need to be empowered over their functional business colleagues so that they can have the power to propose and implement new IT solutions in favor of the business. The trend in the industry (IT) shows the CIO or IT manager

role, different from the functional managers, needs to be at the executive level so that he/she can play the intended strategic role in the business.

## 5.2.Recommendation

This survey attempted to show the changing roles of the IT managers in making the business organizations more effective and competitive. Although the effect of the IT managers are seen by the services and IT technology implemented or planned to be implemented in a certain organization to make it competent enough in this information age, the IT manager role is believed to be strategic and long time oriented. Hence, this study recommends the following for knowledge and practitioners.

### 5.2.1. Recommendation for Practice

It is important to note that CIOs need to know they have lots of work to improve the situations seen in the business organizations and be smart to survive in the competitions expected for the role. Knowing the technical part by itself is not enough. IT managers should learn the business domain knowledge to have the knowledge and focus on the strategic part of the business. The future time expects not only the technical or business rather the combination of both. Furthermore, on top of improving the technical skill and technology knowledge, they have to starve for the business knowledge to compete for the future CEOs.

Moreover, the organization's fate in implementing appropriate IT services and technology is in the hands of the CIOs. You need to involve in the organization's strategic plan development and work accordingly. Failing to do so, will result out off competition for both the organizations and CIOs.

Similarly, organizations need to align the business strategy with the IT strategy by incorporating CIOs in the process and create conducive environment for managers to share knowledge.

Government also should work towards improving the service delivery by involving skilled IT managers in strategic development at the organizational and national level. The involvement of CIOs in strategic development minimizes the unnecessary costs wasted and enables to create competitive organizations.

Higher educations and Government also should continue producing competent IT professionals knowledgeable in the business area on top of the technical skill. They have to incorporate the basics of the business knowledge for IT professionals and also basics of the IT knowledge for

business professionals so as to get professionals who can share ideas with similar language to minimize unnecessary costs.

### 5.2.2. Recommendation for Future Work

Researchers can further investigate the changing effect by taking samples of only CIOs with matured IT services. Furthermore, this research can be expanded or reworked taking both the CIOs/IT managers and the CEOs on similar organizations( having relatively similar IT services and infrastructure) to investigate the impact of the age difference and gap in the IT knowledge in the management team.

Further research taking relatively similar sectors from both the private and public organizations with relatively similar infrastructure and IT services requires to be explored further to get the difference in changing role of IT managers between public and private organizations.

Future researchers can also investigate the CIOs role in increasing the performance of the organizations and aligning IT/Business strategies focusing on organizations with similar IT infrastructure and IT service maturity level.

Furthermore, CIOs are expected to play multiple roles in the organizations. But this is seen challenged as it needs the commitment and readiness of the CEOs and functional managers too. Future research work can be done on the readiness of CEOs and functional business managers' by involving the CIOs, CEOs and functional managers with similar IT infrastructure and IT service maturity level.

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# Appendix I: Recommendation Letter from the Department


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ADDIS ABABA UNIVERSITY
College of Natural Science
School of Information Science


Date April 25, 2016
Ref: -SIS/40/2016

**To Whom It May Concern**

Student Gezahegn Feyssa (ID. No. GSE/0455/06) is a graduate student at the School of Information Science, Addis Ababa University. He is currently conducting a MSc. thesis research under the title "The changing role of IS mangers in the Business world".

I would like to thank you in advance for all the assistance that you would provide to the student.

With Regards,

Martha Yifiru (PhD)
Head, School of Information Science


✉: 1176 ☎: +251-(11)-122-91-91 ☎:2122- 91-92

# Appendix II : Cover Letter for Content Validation

Dear Sir/Madam,

My name is Gezahegn Feyssa and I am a graduate student at Addis Ababa University School of Information Science. Currently, I am working my Master's thesis on: "The Changing role of IS Managers (CIO) in the Business World".

The purpose of the survey is to identify the gap between CIOs role and expectations from the Business organizations, differences in changing role of IS Managers between public and private organization, critical contributions of CIOs for the business in time difference and asses the level of decision making of CIO in the organizations.

As part of the research process, prior to distributing the survey questionnaire for pilot test, the validity of the content has to be assessed by expertise on the area (both academicians and practitioners). I would greatly appreciate if you kindly give me feedback on the content of the survey instrument. Which question need adjustment? Is there irrelevant question in the list? Any important question(s) left? What arrangement` of the questions if different? …

I would like to thank once again for your golden contribution and time. I look forward your feedback from you soon.

Regards,

Email: geanaruki@gmail.com

# Appendix III: Cover Letter for Interview Questions

**Addis Ababa University**

**School of Graduate Studies College of Natural Science**

**Department of Information Science**

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**Dear Sir/Madam:**

I am undertaking a research on "The Changing role of IS Managers (CIOs) in the business world" in partial fulfillment of the Degree of Master of Science in Information Science at Addis Ababa University. Accordingly, I have prepared this survey questionnaire. The purpose of the survey is to identify the gap between CIOs role and expectations from the Business organizations, differences in changing role of IS Managers between public and private organization, critical contributions of CIOs for the business in time difference and asses the level of decision making of CIOs in the organizations.

This research is believed to identify the gap in the actual practice and expectations and enable to take measures in getting competitive advantage of business organizations from the role.

Your honest responses to each question and statement are extremely valuable to the outcome of this research. The questionnaire survey will take approximately 25 minutes to complete and the results of the survey will be used solely for the purpose of academic research. Hence, all responses will be kept confidential and will not affect any one in any case.

Your dedication is most valued and appreciated and I would like to take this opportunity to thank you in advance for your kind participation, genuine and on time response to the questionnaire.

Best Regards,

Gezahegn Feyssa

Email: geanaruki@gmail.com

# Appendix IV: Questionnaire used

**Part I**: Demographic data (**DD**)

1. Please indicate the sector of your Organization's Business

□ Manufacturing □ Finance □ Educational □ Government □ Insurance □ Banking □ Other

2. What is the total number of employees in your overall Organization?

□ under 500 □ 501-1000 □ 1001-3000 □ 3001-5000 □ over 5000

3. What is your Job title in your Organization? _____
4. Indicate is your gender □ Female □ Male
5. How many years have you worked in your present position?

□ below 5 □ 5-9 □ 10-15 □ 16-20 □ above 20

6. Which of the following categories include your age?

□ under 30 □ 30-39 □ 40-49 □ 50-59 □ over 60

7. Whom you are reporting to in your organizational Structure?(*indicate the level of the organizational structure*) _____
8. Are you member of TMT (Top management team) of your organization? □ Yes □ No
9. What is your role as CIO/Manager? (select the options that best fit to you)

□ Leader □ Liaison □ Monitor □ Spokesman □ Entrepreneur □ Resource allocator □ Other

**Part II**: **Basic Function**

Please rate the importance of the following tasks as they are related and *scheduled* in your job. (*Circle the appropriate number*)

| No | Code | Items | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1 | BF01 | Allocating equipment or Materials | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2 | BF02 | Gathering information about customers, competitors, associates, etc. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3 | BF03 | Serving as an expert to people outside of your department | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4 | BF04 | Focusing on the improvement of the organization IT infrastructure and data center issues | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5 | BF05 | Keeping up with Technological developments related to your organization business | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 6 | BF06 | Attending conferences and meeting to communicate your organization's strategy | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 7 | BF07 | Keeping track of staffs/subordinates in their daily routine | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 8 | BF08 | Participating in your organizational strategic plan development | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 9 | BF09 | Keeping up with the purchase/adoption of new technology to your business organization | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 10 | BF10 | Attending trainings and forums to increase the knowledge of your organization business | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

**Part III: Maturity of IT/IS functions**

**To What Extent ……**

| No | Code | Items | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1 | MF01 | Is information system planning linked with organizational strategic planning? | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2 | MF02 | Does your organization use any information system for creating competitive advantage? | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3 | MF03 | Is Information technology dispersed in your organization? | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4 | MF04 | Does each organizational unit or function create and develop its own systems? | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5 | MF05 | Are information systems support personnel centralized in one place within your organization? | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 6 | MF06 | Is the information system department responsible for performing systems Analysis? | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 7 | MF07 | Is your information system department responsible for performing system design? | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 8 | MF08 | Is your information systems department responsible for making policies with regard to Hardware? | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 9 | MF09 | Is your information system department responsible for performing systems planning | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 10 | MF10 | Do you consider your department play major role in your organization business? | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

**Part IV**: Open Ended Questions (OE)

1. Has the role of the CIO/manager changed over the past years?(**OE01**)
   If so,
   Why?_____
   _____
   _____
   _____
   _____
   If not, Why not?
   _____
   _____
   _____
   _____
2. Will the role of the CIO change over the next five years? (**OE02** )
   If So, Why? In What ways?

   _____
   _____
   _____
   _____
   _____

# Appendix V: Interview Protocol and Questions

**Part I**. Introduction

I am conducting this research to develop an understanding of how the role of the CIO is changing in the business environment. Basically, I am interested in finding the critical contribution of CIO's in favor of the Business.

I will be asking you questions concerning:

- Background and Experience
- Role, responsibilities, and work activities as CIO within the organization
- Perception of how the role of the CIO has changed over the past five years
- Perception of how the CIO role will evolve over the coming Five years

**Part II**: Details on the key informants and Organizations (KIO)

1. What is your title and position within the organizational hierarchy?( *get the organizational chart if possible*)
2. What is your Educational Background and nature of prior professional experience? Is it too technical or non technical?
3. What is your role in the organization? (Spokesperson, leader, entrepreneur, resource allocator, Liaison, Monitor or other)
4. How is your organization's strategic and operational dependency on IT?
5. How do you rate the IT capabilities and competencies in your organization to enable the business?

**Part III**: Changing roles and responsibilities question (CRR)

1. What are your key responsibilities as CIO? (get the official job description)
2. What do you actually do, i.e how do you spend your time?
   Describe amount/proportion of time spent on each people, key work-related social network, and purpose of interaction
3. If you could, would you change anything about how you spend your time as a CIO? list Re-allocation of time between tasks and activities identified at 2 and any additional tasks
4. What are the key challenges for managing IT at your organization?
5. What IT- related decisions and responsibilities do you feel that you are not responsible for?
6. Do you consider that you are actively involved in the running of this business? If so, how?
7. Overall, how do you provide value to the business?
8. What motivates you in your role as CIO? (What gets you out of bed in the morning?)
9. Has the role of the CIO changed over the past years? If so, Why?

   If not, why not, given the changes that has occurred? *Reflection upon the profession in general*

10. Will the role of the CIO change over the coming years? If so,
    - Why? In what ways?
    - What is your vision in the coming 5 years as CIO?

# Declaration

I declare that this thesis is my original work and has not been submitted for any Degree in any other University. I have undertaken the study independently with the guidance and support of the research advisor.

Signature: _____

Gezahegn Feyssa

This thesis has been submitted for examination with my approval as university advisor.

Advisor_____

Tibebe Beshah (PhD.)