IDENTIFICATION OF FACTORS AFFECTING SUCCESSFUL ADOPTION OF MIS FOR MINISTRY OF EDUCATION IN SRI LANKA

B.A.U.I.Kumara

(169115J)

Degree of Master of Business Administration in Information Technology

Department of Computer Science and Engineering

University of Moratuwa

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BOHINGAMUWA APPUHAMILAGE UPUL INDIKA KUMARA

(169115J)

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ABSTRACT

The objectives for the education of Sri Lanka have shifted from their former focus on access, expansion, maintenance to improving the quality of education and strengthening, governance and service delivery. Hence, all managers are required to engage in compiling a more composite collection of policy adoptions and more data which originate from various sources and at different levels. As the Ministry of Education requires implementing significant changes to the functions and management process in order to face challenges with confidence.

However, it is evident that the Ministry of Education was unable to adopt management information successfully for the past twenty years. In spite of making several efforts to introduce online systems, functionality and sustainability had become rather challenging.

Therefore, this study attempts to develop a Management Information System (MIS) adoption strategy to ensure successful implementation of MIS for the Ministry of Education by identifying factors that affect implementation. The present study has comprehensively focused on three major independent variables which are: organization; technology and people.

The population for this study comprised of top level managers of the Ministry of Education and Provincial and Zonal level administration and monitoring structure of the education system. Data collection had been carried out from 196 managers in decision making process and both qualitative and quantitative methods were used. After conducting a comprehensive literature survey, many factors were found which are common in numerous public sector organizations.

In the study, technology and people were identified as highly influential factors causing the failure of the MIS implementation at the Ministry of Education in Sri Lanka. Non-availability of an information management policy has been found to be a major factor for system implementation, continuity, and sustainability of the MIS at the Ministry of Education. As per the results of the study, top management support, organization readiness for the acceptance of the system proved to be the positive factors that would affect the feasibility of MIS adoption at the Ministry of Education.

This research brings out a valuable adoption strategy that could be incorporated into the process of Education Management Information System implementation with successful outcomes. Further, this study provides guidance to the public sector organizations that could be explored further as future researches, in the field of successful information system adoption.

Keywords – Management Information System, Education, EMIS Implementation, Successful adoption, Education Management

ACKNOWLEDGEMENT

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LIST OF ABBREVIATIONS

MIS	-	Management Information Systems
EMIS	-	Education Management Information Systems
EPMIS	-	Education Programme Management Information Systems
NEMIS	-	National Education Management Information Systems
IS	-	Information System
PRMS	-	Public Relationship Management System
MOE	-	Ministry of Education
NSBS	-	Nearest School is the Best Schools Project
IT	-	Information Technology
ICT	-	Information Communication Technology
DBMS	-	Database Management System
ADB	-	Asian Development Bank
DSS	-	Decision Support System
CFO	-	Chief Financial Officer
DG	-	Director General
SAS	-	Senior Additional Secretary
AS	–	Assistant Secretary
SPSS	-	Statistical Package for Social Sciences
AD	-	Additional Director
DD	-	Deputy Director
PDE	-	Provincial Director of Education
APD	-	Additional Provincial Director

1. INTRODUCTION

1.1. Overview of the Chapter

This research focuses on the identification of factors that would affect the successful adoption of MIS for the Ministry of Education in Sri Lanka. This chapter provides information associated with the background and motivation of the research, research problem, research questions, research objectives, and research design and the significance of the study.

1.2. Background

The Management Information Systems (MIS) is a major module for the effective management process of an organization. The Education Management System (EMIS) plays a significant role in the functions of education management; it provides appropriate information at the right time as needed to support the management decision making process.

In the endeavor of strengthening of the education management and monitoring process, MIS is one major component for the Ministry of Education in Sri Lanka. In addition, EMIS plays a leading role in the effective decision making process of education by planning and management. Furthermore, MIS allows information to move between departments instantly, reducing the need for face-to-face communication among employees and distributed institutions, thus increasing responsiveness of the organization. EMIS makes it possible for the Ministry to get the right information to the right people at the right time and in the correct form, by enhancing interaction between the organization's people.

An EMIS can only be successful, if it could provide information that supports management of the education system, which in turn implies that managers make use of the EMIS in analyzing, decision making and planning. The Ministry of Education has introduced several Information Management Systems in order to digitalize the management process. If the systems are implemented, functionality and acceptability

by the organization becomes major challenges. At the moment, sustainability of the EMIS had been identified as one of the most critical issues in education sector.

Even though several attempts have been made to establish Information management System (IMS) over last 10 years in the education sector, conceptual and empirical studies have not been carried out to explore the factors that challenge or hinder its successful utilization. This study would help all levels of education management to rethink and make policy decisions for effective implementation of MIS in the education sector. Table 1.1 presents the MIS Implementation history and identified issues at the Ministry of Education.

Table 1:1-Current status of MIS in the ministry

IS Project implemented	Year of implementation	Implementation progress	Issues identified during implementation
EMIS-Education Management Information System	2010	Phase I implementation completed	Data collection System, Services IT Infrastructure, e-Readiness Periodic changes in top-level management
EPMIS-Education Program Management Information System	2015	Implementation completed	Policy change IT infrastructure Data discontinuity between administration
NSBS-School Infrastructure Development Management Information System	2016	Implementation completed	IT infrastructure Top management support Lack of skilled human resources Data error and resistance
PRMIS-Public Relationship Information Management System	2016	Implementation completed	IT Infrastructure Data discontinuity between administration Top management's support for system updating

Source: Audit reports (2010-2016)

As illustrated in Table 1.1, MIS Implementation and sustainability had been a serious problem for the education sector due to various reasons. Ministry of education has been implemented multiple system targeting various requirements. This has been serious issue for the organization and no requirement analysis were done to cover

overall process. One of the biggest problems of ministry having multiple systems is that IT management can become a nightmare. Customizing these systems, integrating them and maintaining them with patches and upgrades can be complex, costly and sap critical time. With a single system, the time ministry save can be spent concentrating on core business activities and improving the organization performance. Ministry will also have more time for future planning, strategy, education development with the burden of paperwork and finding or consolidating relevant data taken away.

When the management deficiencies accurate information, provision of an effective and quality service to the beneficiaries and the allocation of resources for schools and provinces become more difficult. Reporting progress from the bottom (School to Ministry) to the top proves to be disorganized and inefficient. These have seriously affected the efficiency of the decision making process and the organizational performance of the Ministry of Education.

Maintenance is a key driver of the success of your management information system. It's also a key component of the overall cost involved. One of the most common challenges posed by the education management of multiple systems is the fact that ministry required to pay for the services of multiple system providers.

Previous research studies have identified a number of common factors, causing the failure of MIS in public sector organizations. Figure 1.1 shows the common factors affecting the information system implementation in the public sector. According to literature, the public sector makes it potentially a much different setting for information system management than the private sector. Additionally, the public sector has multiple, conflicting and often intangible goals. As illustrated in figure 1.1, environmental factors, organization/environment transactions, internal structures and processes, bureaucracy and paperwork, political influences and data discontinuity between the administrations are the common factors that affect the Information Technology (IS) implementation. According to the audit reports in 2014 and 2015, the education management systems developed with the help of the Asian Development Bank (ADB) funds, which were unable to generate reports for management at school, zonal, provincial and ministry levels.
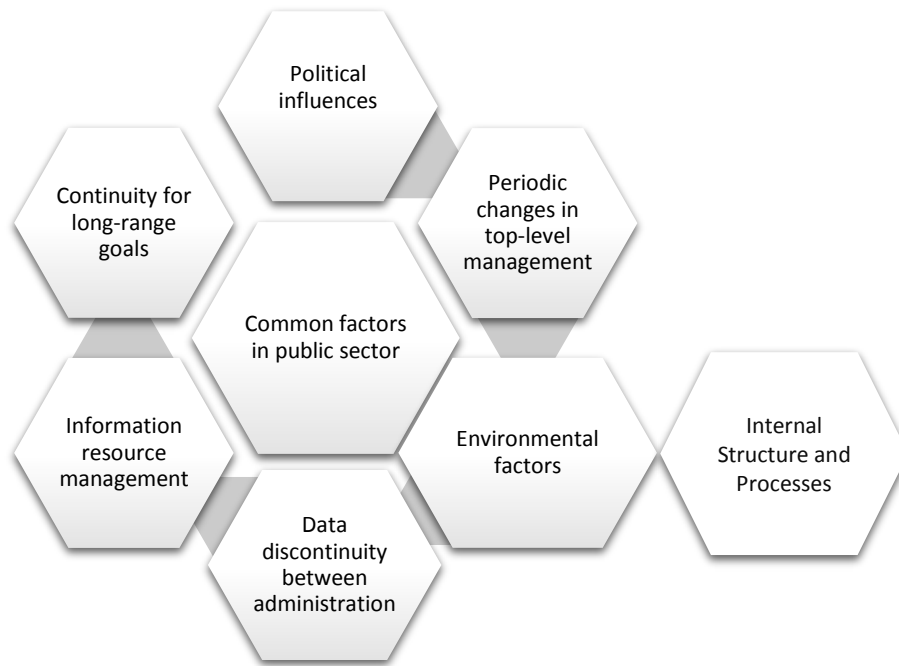
Figure 1.1: Common problems in IS adoption in public sector organizations

The present study attempts to focus typically on factors that have affected the successful adoption of MIS in the education sector, assess the current readiness of organization to adopt MIS and to develop MIS adoption strategy for ministry of education.

1.3.   Motivation

The Implementation of MIS is challenging in any public sector organization. The Education sector in particular, is one of the largest, complex and most challenging sectors among all public sector organizations. Despite of funds being invested on establishing information systems, only a minimal or limited outcome and impact on the education management process is evident. Research studies that focus on EMIS in Sri Lanka are limited. This study will provide the insight for all education management and policy makers in ministry of education for successful implementation.

1.4. Research Problem Statement

EMIS is the most important and essential component which is needed to provide effective and efficient services to the beneficiaries in the education sector. Additionally, EMIS helps education management in its strategic decision making process. To fulfill the above requirement, a number of EMIS have been designed, developed and implemented at the Ministry of Education during the last 10 year period. Even though systems are in place, functionality and adaptation had been a serious issue for the monitoring division in the Ministry.

Investments made for the development of MIS for the education sector had failed to gain the desired impact. In addition, the system process was not changed due to new information systems. Considering the above context, it is important to notice that a lack of awareness on numerous and varied challenging issues that affect the implementation process which could cause problems for the entire process of MIS development and deployment. Furthermore, the problem concerning the lack of understanding of key issues which hinders success, seems to be a serious problem for the MIS implementation process. Therefore, it is essential to identify factors that affect success and failure and manage them in order to carry out an effective and fruitful implementation of MIS. Additionally, MIS implementation could influence the Ministry of Education while these effects are related to the consequences of the education management processes. Consequently, this issue is critical and crucial for an organization to consider when implementing a new MIS in their respective organization. The problem addressed in this study focuses on determining factors that have caused the MIS Implementation to be a failure in the Ministry of Education. Additionally, the problems addressed in this study intends to identify and assess factors that would affect the successful implementation of EMIS.

1.5. Research Scope

This research has taken into consideration one of the most significant sector among all public domains which is the Ministry of Education. The study will target all top level managers of different management and monitoring levels in the education sector,

namely, Zonal Level (98), Provincial Level (9) and Ministry Level. This study will include all managers who are in the decision making process, but will not address divisional and school level managers due to their less MIS usage in the decision making process. In addition, study will identify factors which are useful for the successful adoption of MIS in future for improving the efficiency and effectiveness of the management process.

1.6. Research Questions

The problem addressed in this study focus the challenges and major factors affecting the MIS Adaptation. In order to solve the research problem, the following research questions have been identified:

- Why has the implementation of MIS been a failure in the ministry of Education?
- What are the key factors that need to be identified in order to achieve successful implementation of MIS?

1.7. Research Objectives

In order find the answer to the research questions, this study encompasses one major objective and two supporting objectives. The key objective of this research is to "develop an effective adoption strategy" for the implementation of MIS at the Ministry of Education. The following sub objectives were identified to achieve the primary objective of the current study:

I. To identify and explore the major factors that lead to the successful adoption of MIS

II. To assess the feasibility of the adoption of MIS at the Ministry of Education

1.8. Significance of the Study

The study would be a significant endeavor for the Ministry of Education in indicating how MIS could help to provide a service via an efficient and effective management. Adaptation of MIS could assist the Ministry to gain competitive advantages through effective management, mainly because it plays a crucial role in providing appropriate

data and information, both internally and externally and hence enabling an efficient management function.

Several studies had addressed important issues related to MIS Implementation, but limited empirical studies have been conducted to identify the factors that affect the successful adaptation of MIS in the education sector. This research study is a timely requirement for the country since it attempts to determine the factors that had affected the implementation of MIS in the education sector.

This research provides the basis for the Ministry of Education to develop a policy for education information management. In addition, this research has its special significance in providing guidance for planning, implementation and the sustainability of the management information system.

The top management of the Ministry of Education will be benefited from the current study since the findings and recommendations will guide the successful adoption of MIS in future.

The findings of this research would be useful not only for academics and business people, but also for policy level education managers and decision makers at the Ministry of Education in Sri Lanka. This research is considered a pioneer study in investigating a novel and important sphere; the successful implementation of MIS for the education sector.

1.9. Outline

The current study focusing on the "Identification of factors affecting the successful adoption of MIS", provides an in-depth analysis of the present situation and describes challenges and problems related to MIS Implementation, in addition to identifying the key issues that affect the successful implementation of MIS. Research outline provides an overview of the report and clear definitions.

1.9.1. Definitions

This study uses technical terms and concepts which may be difficult to understand for a first time reader. Therefore, definitions are created and provided here in order to provide a clear understanding of the real problem. Main definitions provided here are significant for this study which will explain the main objective.

Management Information System (MIS): MIS refers to an information system that provides timely and accurate information to manage and support managerial decisions within an organization. It also provides information which enables the timely and effective decision making that are necessary for planning, directing and controlling the activities for which they are responsible and also to help businesses achieve their goals and objectives. In this study, MIS will be used as a similar definition to Information System (IS).

Education Management Information System (EMIS); EMIS refers to an "organized group of information", a system that collects, stores, integrates, processes, organizes, analyses, manages and distributes information for educational planning and management.

MIS Implementation: is a part of the information system development process that is dedicated to deliver the information system into its context of use.

MIS Adoption: describes the adoption or acceptance of a management information system, according to the organization, technology and people's characteristics are defined in this definition.

Successful Implementation: means that the system in place is recognized by users in the top management who are directed towards pulling information from functional or strategic systems.

1.9.2. Outline of the study

In order to provide the reader with an overview of the thesis, the research structure and details are summarized below and presented in the following chapters:

Chapter 1 – Introduction:

The background of the thesis is presented in this chapter and provides the reader with the basic understanding of the subject area, the problem and its importance and motivation. In addition, the chapter will define the research problem and the objectives of the study.

Chapter 2 – Literature:

This chapter explores, analyses and extracts similar findings in order to build up the framework of the current study. Additionally, this frame of reference presents an understanding of the relevant studies on MIS and factors identified by previous researchers.

Chapter 3 – Methodology:

This chapter presents the empirical and theoretical approach used to derive the results of the research endeavor. Current research has used a hybrid method (mixed model) in order to achieve the objectives.

Chapter 4 – Analysis:

In this chapter, results of the data analysis are presented. The data collected were then processed in response to the problems of study. The results derived through statistical analysis are presented in this chapter. And this chapter also provides the readers with explanations of the findings related to the research questions.

Chapter 5 – Conclusion and recommendation:

This chapter will present the readers with the main findings related to the problems and strategies for the successful implementation of MIS together with identified key success issues, current status of the factor and factors that affect the success of MIS Implementation.

2. LITERATURE REVIEW

2.1. Chapter Overview

The management Information Systems could be defined as an information systems that generates reports which assist the managerial monitoring and control of organizational functions, resources or other responsibilities (Heeks, 1998). Implementation of MIS for education and public sector organizations had become a challenging task. Though many researchers had carried out private sector information system failure but some limited literature on Information System (IS) failure in public sector organization. This chapter describes the definition, implementation process together with the challenges and problems in public sector and success key issues and some strategies developed for the successful adoption of management information system.

2.2. What is EMIS?

According to Bhatti & Adnan (2010), EMIS should be able to provide comprehensive, integrated, relevant, reliable, unambiguous and timely data to education leaders, decisions makers, planners and managers to perform their responsibilities efficiently to achieve the set goals.

Bernbaum and Moses (2011), have pointed out an important objective of the Ministry of Education. EMIS is to collect data from schools which making it widely available to those who need it the same year that the data were collected, often through an annual school census report. Villanueva (2003) has defined the EMIS as an organized group of information and documentation services that collects, stores, processes, analyzes and disseminates information for educational planning and management.

Trucano (2006), pointed out in his study that establishing effective working relationships between three management layers would presents a significant challenge for EMIS development in Nigeria and also common with other developing countries, where there are issues of capacity and commitment.

2.3. Importance of EMIS for education sector

According to Cassidy (2006), educational goals and objectives in many countries have transformed their focus on access, expansion, maintenance and control to quality, development, efficiency, effectiveness, equity and performance. These changes need monitoring and evaluation very closely and a feedback mechanism should be active real-time. Hence the education management system provides services to multiple sources and from multiple levels in the education institutions. Collecting, organizing, integrating and analyzing these data will give an insight to the education managers to make decision accurately.

Koofi (2007), pointed out in his findings that the education system requires an effective policy-making mechanism and monitoring system through data and information. According to Koofi, most of the current Education Management Information Systems (EMIS) are typically limited to centralized databases. They collect basic information and school level data.

The objective of an EMIS, is not only to collect, store, and process, analyses, manage and disseminate information, but also to help education policy making by providing reliable, relevant, timely and accessible information. The EMIS is gradually being recognized as an indispensable tool and support for the formulation of policies, management and evaluation in the education system (Carrizo, 2003).

Hugh (2007), pointed out that information supports strategic planning for education while acting as a diagnostic tool in assessing the existing capacity and characteristics of the education system. Hugh indicates that these attributes assist with setting priorities for future development and identifying areas of greater need for resource allocation. Information also acts as a monitoring and evaluation mechanism that enables planners and policy makers to assess, if the education strategic plan (ESP) was achieving its stated goals.

Moreover, there is evidence that the EMIS could potentially provide a powerful management tool capable of contributing to the improvement of educational

performances. It enables decision makers to identify problem areas, reduce operational costs and provide a systematic way of addressing educational challenges. If effectively implemented, the EMIS is capable of raising educational awareness, motivating employees to search for innovative solutions and increasing educational efficiency (Gunningham, 2007). Furthermore, the EMIS makes efforts to assess the performance of the MOE system. It monitors the distribution of resources, and plays an active role in providing information to decision makers (Wako, 2003). In addition, another major function of the EMIS, other than collecting, storing and processing information, is to facilitate detailed analysis and synthesis of data in order to draw upon the most relevant information to help in educational planning and policy decision-making (Carrizo, 2003).

The main purpose of an EMIS is to integrate information related to the management of educational activities, and to make available for the decision makers, as well as the other parties, to use in helping them to make the correct decisions (Connal, 2005).

2.4. EMIS Implementation challenges

According to Moses & Bernbaum (2011), most education management system development work, the combination of the people (leadership, managerial, and technical) and process (administrative requirements, timelines, job skills, and funding) are frequently the most difficult to align with the goal of EMIS.

Keil (2001), identified three major challenges in implementation of the MIS Project. This study is focused on illuminating the problems of implementing systems that require mutual adaptation of technology and organization over time. This study mainly focuses on three major models. (1) a technology acceptance model, (2) an organizational change model, and (3) a model that views implementation as organizational problem-solving. The results of this study suggests that barriers relating to the implementation infrastructure could be dominated by other barriers that may exist. The findings also suggest that the most frequently mentioned barriers to use may not be the most critical barriers and that a holistic understanding of task/technology is important for its successful implementation. Finally, this study indicates that an

effective problem-solving process is needed to enable the organization to make critical adaptations to both the organization and the technology.

According to Tel-Aviv University research (2005), Implementation MIS in to school management is a big challenge. This research findings identified educational administration pertaining to schools have special administrative characteristics. This study findings developed five components framework (managerial, structural, psychosocial, goals and values and technical) are presented and it's potential as a tool for successful SMIS implementation.

2.5. Major issues of MIS implementation in public sector

Goldfinch (2007), had pointed out three major types of failures in the information system projects. As Goldfinch summarizes in his research study, system and user failures are a major type of failures. And also this research has identified ten critical factors for information system development and implementation in public sectors. Information, Technical, People, Management, Process, Cultural, Structural, Strategic, Political and Environmental. Hashim (2010), identified barriers to the information system implementation in the local government. Strategic planning, budgeting, timeframe and scheduling, contracts and external consultants and outsourcing are highlighted in this study.

Abbas & Fatima (2017), in their study found that 15% of e-government projects are successful and also have identified four factors for failure, technology, management, politics and finance. This study suggested that the government should make new laws and regulations to help the implementation of these projects and bureaucracy should eliminate any power struggle during and after implementation. The majority of public sector IT projects fail either totally or partially. The percentage of failure is even more in developing countries (Ashraf, Khattak, Zaidi, 2010). Zailani (2010) investigated in her study factors that could influence the success of its adoption in the Malaysian public sector. This study pointed out a few major factors like provide sufficient budget for IT development, develop favorable IT policies and plans for agencies and departments to be affected successful with the adoption of IT Projects.

Effective project control required good governance measures to be in place (Johnstone, Huff, Hope, 2006) for the success of IT Project. This research finding shows, where IT projects are large and complex, which is often cited as a major contributor to project problems. Conflict, and its resolution, will be affected by factors that are difficult to control, including culture and politics. According to Mohagheghi & Magne (2017), many public sector software projects had failed to deliver the expected benefits and goals. This study findings also shows major challenges had been related to technical issues, project planning and management, transition of the product to the user organization, involvement and competence of the client and benefit management. Warne and Hart (1996), highlighted the impact of organizational politics on information systems project failure. It had also found that factors that influence success or failure in information systems development projects are top management support, user involvement and the use of effective development methodologies.

The public sector has multiple, conflicting and often intangible goals (Studies, Gorr, Newcomer, 1991). This research has conducted as in depth analysis on three characteristics of thpublic sector. According to study major characteristics of the public sectors has been analyzed.

- **Environmental Factors** – "*Less market exposure (and therefore more reliance on appropriations) resulting in less incentives for productivity and effectiveness, lower allocative efficiency and tower availability of market information; more legal and formal constraints and higher political influences, including impacts of interest groups and need for the support of constituencies…p.14*"

- **Organization/Environment Transactions**-"*More mandatory actions due to the unique sanctions and coercive powers of government; wider scope of concern and significance of actions in the "public interest"; higher level of scrutiny of public officials; and greater expectations that public officials act fairly, responsively, accountably, and honestly… p.14*"

- **Internal Structure and Processes**- *"More complex criteria (e.g., multiple, conflicting, and intangible); managers with less decision- making autonomy, less authority over subordinates, greater reluctance to delegate and a more political role for top managers; more frequent turnover of top managers due to elections and political appointments; difficulties in devising incentives for individual performance; and lower work satisfaction and organizational commitment... p.14"*

A consequence of these difficulties is that information requirements are fundamentally more difficult and unstable in the public sector organization.

2.6. Factors that affect MIS implementation

The success of a system however, is not solely dependent on technical aspects alone. Study on Education Information Systems (Jamaluddin, Razali, Deraman, 2011) has focused on critical success factors (CSF) that affect its development in a holistic manner. This study explores several critical factors that influence the success of Education Information Systems development, particularly, for education management. Alwahaishi and Snasel, (2012), have identified three factors affected to implementation of MIS in developing countries. According to this study, findings indicate that there had been an increase in reported IS failures and the adoption issues are not just technical, but encompass wider societal, organizational, and economical factors.

Pushpakumara & Wanniarachchige (2014), have conducted study on Information System success in public sector organizations; with special reference to organizations located in the Matara district of Sri Lanka. This study investigated the effect of system quality, user quality and service quality on the Information system is success. The author has concluded his findings based on the data collected during 2013 on 32 public sector organizations located in the Matara district. The findings suggest that issues associated with the system quality, service quality and lack of a clear and centrally planned mechanism for implementing information systems, have seriously diluted the potential benefits associated with information system success. These study findings

emphasize the necessity of focusing on a central ICT policy and implementation of consistent and interoperable solutions rather than ad hoc locally developed solutions for improving the information system success at public sector organizations. In the recommendation of this study pointed out the provision of necessary infrastructure, support services and qualified staff were also essential in ensuring the successful implementation of the information systems in the public sector.

The revolution in computer technology and the recognition that managerial decision making could benefit from the use of this technology have resulted in the rapid development and implementation of sophisticated management information systems (Curlee,Jonn 1987). Both the public and private sectors are currently adopting these new systems in an attempt to increase organizational productivity. In many cases, however, the new systems are failing to produce the productivity bonanzas expected by many system implementers and users.

According to Chou and Chen (2011), the risk resolution strategy has a positive effect on software success. As expected, software projects with low goal conflict exhibit better performance of risk resolution strategy, productivity, and process satisfaction than projects with a high goal conflict. Vicente (2009), pointed out that organizational and operational factors affect the successful implementation of a Data Warehouse. Organizational capability directly affects the information system project selection (Syaifudin, Abdullah, Udin, 2010). This research found that economic and organizational capability depended on information system project selection.

According to Wanyama and Zheng (2010), Organizational culture and information systems implementation has positive correlation. In this paper authors were tried to identify organizational factors that could affect the implementation efforts of an Integrated Financial Management Information System (IFMIS). Findings of this study suggested that many of the problems in the IFMIS implementation may be attributed to organizational factors and that certain issues are related to the existing organization culture within the government. Wanyama, Zheng (2006) have introduced an integrative framework for contextual factors affecting its implementation. With this framework can provide companies with a useful tool to evaluate their current

environment, determine its strengths and weaknesses and assess how these would affect IT implementation.

In the Deborah & Pitula (2009), study pointed out that development projects in information and communication technologies may fail due to being incompatible with the existing work practices or cultural values. Gichoya (2005), has targeted in his research critical factors or variables which could be identified as important in terms of their effect on ICT project implementation in government. As Gichoya pointed out in his research framework, resources, management support, poor infrastructure, user, ICT facilities, information system quality, politics, skills project team are the major factors for major variables for MIS implementation success.

While discussing dimensions of ICT failure, Beynon and Davies (2002), considers both the horizontal and vertical dimensions of the informatics model. The horizontal dimension is expressed in terms of the difference between development failure and use failure. The vertical dimension is expressed in terms of failure at the level of ICT systems, IS projects, or organization, or at the level of the external environment.

Appropriate technology transfer (Ifinedo, 2005) can be a success in the government sector projects. Ifinedo has proposed seven best practices in ICT they are:

1. Do not underestimate the complex environment in which ICT programmes evolve. ICT projects are too often believed to have a technology focus.
2. Be sure to select a project that is expected to demonstrate the greatest benefit for your target group.
3. Government staff should be 're-skilled' to anticipate the changes that accompany an ICT structure and new roles
4. Identify the right technologies.
5. Make a decision on how an organizational process fits your technology.
6. Strong programme and project management is essential to develop and implement successful ICT solutions.
7. Do not underestimate the total cost of ownership (TCO) of an ICT project.

Gichoya (2005), published in his findings in the research study e-Readiness assessment is a must before the ICT project implementation. In this research study e-Readiness assessment is suggested conducted on:

- Data systems infrastructure
- Legal infrastructure
- Institutional infrastructure (standardization of various departmental means of communication and the technology that is used)
- Human infrastructure
- Technological infrastructure
- Leadership and strategic thinking readiness (short, medium and long term plans by specific government ministries)

In this regard, e-Readiness assessment could be used as an information-gathering mechanism for governments as they plan their strategies for ICT implementation.

According to Trucano (2006), to ensure that data collection, analysis and dissemination processes occur in an efficient and effective manner, it is important that the appropriate ICT Infrastructure for the context in which EMIS operates. Trucano has highlighted that government departments must ensure that choices about ICT infrastructure are determined by their own information requirements and are compatible with systems being used by other units or government departments. According to Cassidy (2005), digital and cellular phones are already being used by some countries in Latin America and the Caribbean for data collection and dissemination.

2.7. Factors affecting the implementation success or failure of information systems

The management information system is one of the most important tools in any organization, which aims to provide reliable, complete, accessible, and understandable information in a timely manner to the users of the system (Al-Mamary, Aziati, Shamsuddin,2014). On the other hand, assessing the success of information systems

has been identified as one of the most critical issues in the IS field. This study has empirically examined the impact of these on perceived usefulness and user satisfaction towards impact on organizational performance. This study has made attempts to focus deeply on the characteristics that lead to the successful adoption of MIS in organizations and to investigate the effect of MIS in organizational performance.

Gakunu (2004), identified in his research study factors for failure are those occurrences that constraint proper/smooth implementation of ICT projects in government. Some of these factors for failure are infrastructure, finance, poor data systems and lack of compatibility, skilled personnel, leadership styles, culture, and bureaucracy and attitudes.

Khaled (2004), has pointed out successful implementation and sustainability of ICT projects have failed due to few factors. Some of these factors for failure are identified in this study as follows:

- User needs
- Technology
- Coordination
- ICT policy
- Transfer of ICT idolizers
- Donor push

Qassim (2006), identified in his research study project management, users, organization culture, team skills and knowledge, and many other aspects that are linked directly to the organization are the major factors for IS adoption failure. The most common risk factors ranked were the outcomes of the research.

1. Lack of top management commitment
2. Misunderstanding of scope/ objectives/requirements
3. Lack of client/end-user commitment/involvement
4. Changing scope/objectives
5. Poor planning/estimation
6. Inadequate project management

7. Failure to manage end-users expectations
8. Conflict among stakeholders
9. Change is senior management ownership
10. Lack of adequate change control

Several conceptual reasons could be found in the new MIS failure (Curlee, Bruce, Tonn, 1996) either partially or totally. These reasons have been divided into three main categories in their study: (1) failures due to technological inadequacies, (2) failures due to organization constraints on the availability of labor input to the system, and (3) failures resulting from conflicts between the organization's goals and purposes for the new MIS and the preferences of individuals and groups using the system.

2.8. The impact of organizational factors on management information system

Organizational attributes are important predictors for the spread of usage of information technology innovations. Ashadi & Ahamad (2009), have identified in their study organization factors highly influence on MIS success. This study has identified seven factors on MIS success. IT department structure, top management support, management style, management IT knowledge, goal alignment, resource allocation and IT infrastructure. This study also identified five MIS success dimensions; system quality, information quality, perceived ease of use, organization impact and individual impact.

Organization Culture

Organizational culture (OC) and information systems adoption is a phenomenon that has been widely researched with several case studies. A noted description of culture is that "*It is a surprisingly powerful influence on employee perception, attitude and behaviours*" Lacey (2009). Manfred (2011), identified the importance of organizational culture in institutional transformation by stating the importance of performing an organizational culture audit. It has even been argued that the quality of a system is improved when users 'provide expertise about the organization the system is to support' (Siau , 2007). The need to study organizational culture in order to

identify what are the ingrained values is very crucial to managing change and implementing IS. An organization is made up of a number of competing values and these are the values that make up the culture of the organization, Sanderson (2006).

Jane Wairimu (2013), had done a study on how the organizational culture of the University of Nairobi could have affected full the adaption of the human resource management information system. Conclusion of the study pointed out that, the human resource management information system could have been adapted well, if the users' values and methods of working were ingrained in the system.

Rezvanfar and Rezaei (2009), analyzed the impact of organizational factors on management information system success. Using perceptual measures, this study investigated the influence of organizational factors on MIS success. Seven items were identified to influence MIS success. They are IS department structure, top management support, management style, managerial IT knowledge, goal alignment, resources allocation and IS infrastructure. Rezvanfar and Rezaei research study also identified five MIS success dimensions; systems quality, information quality, perceived Ease of use, organizational impact and individual impact. This study also found that the MIS success variables are significantly and highly correlated. The study also found that all the organizational factors are significantly correlated to the five IS success factors investigated; the system quality, information quality, perceived ease of use, organizational impact and individual impact.

Besha, Negash, Amoroso (2009), had done a study on Impact of Organizational Culture on IS Implementation Success in Ethiopia: the Case of Selected Public and Private Organizations. This study investigated the relationships between organizational/corporate culture and management support with IS implementation success in selected organizations. This presented a model for IS implementation success in a low-income country context.

Top management support

In reviewing the influence of information systems on today's organizations, it becomes evident that top managers play a crucial role in their inevitable success or failure (Kumar, 2006). This paper reveals that top managers who foster a positive attitude

towards information systems can build a powerful coalition group to develop a vision and foresight that is aligned to the corporate strategy. In deploying vehicles such as steering committees, top managers could communicate this vision, thus ensuring organizational wide buy-in and increasing the information systems' chances of coming in on time and under budget.

According to Trucano (2006), donors always have unrealistic expectations about what could be achieved in a short time period and underestimate the challenges facing EMIS. Trucano reviewed four country cases in his research study and reveals that this did not always occur and significant problems are often experienced with the operation of EMIS at all levels of the education system, and in the vast majority of instances, systems are unsustainable without a considerable amount of donor support. Similarly, the utilization and dissemination of EMIS outputs are often lower than anticipated.

Buruncuk and Gulser (2004), in their study recommend a model to determine factors affecting implementation of information technology success and failure. This study examines the success and failure factors of implementing Information Systems in critical business areas. As factors rank in this study, all factors grouped under five main headings as follows:

1. Environmental factors
2. Factors about internal organizational structure
3. Factors about project team structure
4. Appropriate technology and project methodology
5. After project support

Munene (2015), identified factors affecting the implementation of management information system in selected financial cooperatives in Nairobi and Kenya. A study by the University of Nairobi on factors affecting the effective implementation of integrated financial management information systems (IFMIS) in government ministries in Kenya established that the effective use of the system is affected largely

by sabotage and resistance. The study also established that management support were lacking while top management did not inspire the user. The capacity and technical knowhow was found to be low due to the lack of training and the hurried implementation of the system. The study recommended that the government employs a change agent to oversee the implementation of the IFMIS while the users system undergo on the job training in order to improve their skills and capabilities for the use of the system (UoN, 2013).

King and Burgess (2007) carried out a study entitled understanding failures and successes of MIS. The study was carried in UK. According to the study, MIS programs in organizations had been criticized on the grounds of excessive time, cost and disruption of implementation and on many occasions the limited benefits once the systems become operational. The study further postulated that for small organizations, putting on sophisticated and costly IS systems would lead to unnecessary losses. While the sophisticated MIS equipment which were not so beneficial to small organizations in terms of efficiency and cost reduction the reason for the reluctance of some of the management in implementing the same.

People characteristics

Another important factor in MIS development is the Information Systems Infrastructure. There is a misconception that it is costly to develop or buy a knowledge management system. This might be one of the reasons why many top managers were reluctant to develop a knowledge management programme in the research carried in Malasyan companies by Choy (2006). Organizations must understand that there was no silver bullet in knowledge management systems that would worked in one company, while not working for another. Further, organizations could make use of the technologies they currently have at hand, rather than buying the entire system which might not fit the company, as elucidated by Tiwana (2011). A team comprising of IT

personnel and other related personnel could be formed to look at what are the requirements of the company were and then look at what are the other technologies available so that they could be combined into the system. It is worth remembering that an information system is just an enabler to knowledge management. As mentioned by King (2007), the successful deployment of knowledge management requires an organization to think in terms of applications and how the people could use the applications. It is not the technology itself that induces knowledge sharing, but rather a separate motivation to share knowledge (Hendriks, 2009).

Block, (2005) and Keil (2007) conducted a study on the hindrances to effective implementation of MIS in health organizations in USA. The study showed that lack of user commitment, ineffective communications with users, conflicts among user departments and lack of IS training by some personnel were a hindrance to effective implementation of MIS systems in organizations. Although this study may be very relevant in the current study, it was carried out with reference to health organizations. Data accrued from such a place while environment may differ due to the mode of operations and placements of such organizations. Hence, a true reflection of the same must be sought from the local scenario.

Among the factors found in the study by Ravichandarani (2006), contributing to ineffective of MIS implementations were among others, cost overruns, missed deadlines, inaccurate features and out-and-out failure. This study though relevant in the current context was carried out in Miami involving large companies. The study was not based on primary data. Use of primary data could have provided more tangible information on the issue of MIS implementations.

Mugambi (2011), studied factors influencing the implementation of Integrated Financial Management Information System software, using the Kenya Institute of Education as a case study. He found that the effective training of technical staff and end users was effective although, user manuals were not provided. However the training was not holistic. There was minimal resistance to change as the staff had been sensitized on the need for a new system

While discussing the dimensions of the present MIS failure (Curlee,Jonn 1987), several conceptual reasons why a new MIS may fail either partially or totally. These reasons has been divided into three main categories in this book: (1) failures due to technological inadequacies, (2) failures due to organization constraints on the availability of labor input to the system, and (3) failures resulting from conflicts between the organization's goals and purposes for the new MIS and the preferences of individuals and groups using the system.

Technology

Holden & Karsh (2008), pointed out that their study of technology acceptance was more important than other factors. They have proposed the Technology Acceptance Model (TAM) for health care sector for IT acceptance and use.

According to Durodolu (2016), organizational characteristics, system characteristics, users' characteristics and other variables were necessary to explain the procedure for acquiring new skills. In the 21st century, efficient access and utilization of information resources depended on the ability to effectively use the apparatus of Information Technology. This study shows that confidence in the use of technology could lead to increased personal control, flexibility and also the competent use of information. Therefore, increased knowledge could lead to better productivity. This study also reveals that inability to control and accept the use of new technology could be overwhelming which may ultimately lead to anxiety that would weaken the quality of decision making.

2.9. MIS adoption strategies, adoption models and frameworks

Hasan and Shamsuddin (2015), developed an integrated model for the successful adoption of management information systems. A major contribution of this study is the formation of a theoretically based model which integrates the technological, organizational and people factors. Moreover, this study provides the impetus for organizational administrators and managers to continue adopting management information systems in their organizations.

As Gichoya (2005), recommended and proposed in his research that the best way to achieve the maximum benefits for ICT implementation was to have all factors success with no occurrence of the factors for failure.

- Provide a basis on which to analyze and specify international support and cooperation from development partners on ICT projects
- To produce guidelines that the governments could use to help define their needs and agendas with regard to government ICT implementation and use
- Provide a basis for assessing good practice for ICT implementation in government
- Contribute to the body of knowledge on ICT implementation

However, given such a situation, an action to increase the chances of success is required. Clockwork (2004), suggests the following framework for implementing e-Government projects. The framework consists of five stages:

- Examine national e-Readiness
- Identify and prioritize themes
- Develop a programme of action
- Apply to target groups
- Implement solutions – the final stage of the framework, is to implement the solutions.

A key factor in this implementation is to ensure that the organization was ready and in place to realize the new activities and corresponding changes. Successful organizations should collect high quality data (Hasan, Shamsuddin, Aziati, 2013), which would lead to high quality information. For successful and effective managerial decision making, it is necessary to provide accurate, timely and relevant information to decision makers. The Management Information System is a type of information system that takes internal data from the system and summarize it to meaningful and useful forms as management reports to be used in managerial decision making. Management information system improves information quality and subsequently effects on managerial decision-making.

Trucano (2006), had introduced seven guiding principles for the development of an EMIS strategy. They are

1. Identify the development characteristics of your country
2. Determine which EMIS strategy is most appropriate, taking into outstanding possible risks
3. Develop a strategy that is capable of being implemented
4. Ensure that results could have maximum impact as for quickly as possible
5. Pilot your strategy to ensure problems are identified prior to going nationally
6. Develop a data production cycle, identifying who does what and when
7. Ensure that commitment to this strategy is obtained from educational professionals and other stakeholders

According to Trucano, any strategy for EMIS will have to take into account the specific development characteristics of an individual country, including: demographic issues, levels of socio-economic development and political characteristics. Trucano has identified the relationship between development characteristics and type of EMIS strategy. Table 2.1 presents characteristics and their relationship.

Table 2-1 Relationship between development characteristics

Demographic characteristics	Development characteristics	Type of EMIS strategy
• Population size • Rural/Urban population ratios • Large developing country • Medium developing country • Small land locked • Small island state	• Level of economic/social development • Type of state bureaucracy • Characteristics of political system • Status of civil society • Level of demand for education data	• Top down approach • Bottom up approach • State level approach • Incremental approach • Combination of the above

Source: "Rethinking Education Management Information Systems: Lessons from and Options for Less Developed Countries (2006)"

There are several characteristics of the success or failure of the implementation of management information systems in organizations (Al-Mamary, Shamsuddin, Aziati, 2014). Most of the existing models focus heavily on technology characteristics or compared to organizational characteristics and human characteristics. This study will focus on all characteristics for MIS success. This study combines four theories, namely as technology acceptance model, information system success model, computer usage model and personal computing acceptance model.

According to Jayasinghe and Wijayanayake (2014) top management support and System complexity proved to have an impact on all three phases of Computer Based Information Systems (CBIS) adoption and mainly it was the Pre-implementation and/or Implementation capabilities that showed a significant correlation with the system adoption success. This research undertaken to develop a feasibility assessment model by which an SME that is considering adopting CBIS, will be able to assess whether the adoption is feasible. And also this research identifies that Organizational, System, Technological, HR and External Factors to have influence on SMEs' Computer-based Information System adoption success.

Dorsey (2009), has pointed out three major factors for the successful Implementation of IS projects. Each of these factors are common to any project's success. He define these as a tripod. All three legs must be in place for the tripod to stand sturdily. Information System development project these three "legs" or critical success factors consist of Top management support, a sound methodology, Solid technical leadership.

Jayasighe & Wijenayake (2013), have conducted a study on Feasibility assessment model for successful adoption of information systems in small and medium enterprises. This research was undertaken to develop a feasibility assessment model by which an SME that is considering adopting computer based information system was able to assess whether the adoption was feasible. Jordan and Eleyan (2012). This research had been aimed to examine the main factors that influence the successful adoption of Decision Support Systems (DSS).

Durodolu (2016) has identified the relationship between humans and technology through Perceived Usefulness (PU) and Perceived Ease of Use (PEU). This study evaluated the TAM's main variables for Information Literacy acquisition such as: Perceived Usefulness (the intention to use, user training, computer experience, system quality) and Perceived Ease of Use (computer self-efficacy, perception of external control, ease of use, internet self-efficacy, efficacy of library use, computer anxiety, information anxiety, perceived enjoyment and objective usability, behavior and intention). The study identified resistance to information systems as the main reason for the failure of adoption of new technology in attaining information literacy. It was suggested that appropriate instruction and training on the use of technology and application to real life situation could lead to better information literacy.

Besha ,Negash ,Amoroso (2009), had done a study on the impact of organizational culture on IS Implementation Success in Ethiopia: the Case of Selected Public and Private Organizations. This presented a model for IS implementation success in a low-income country context.
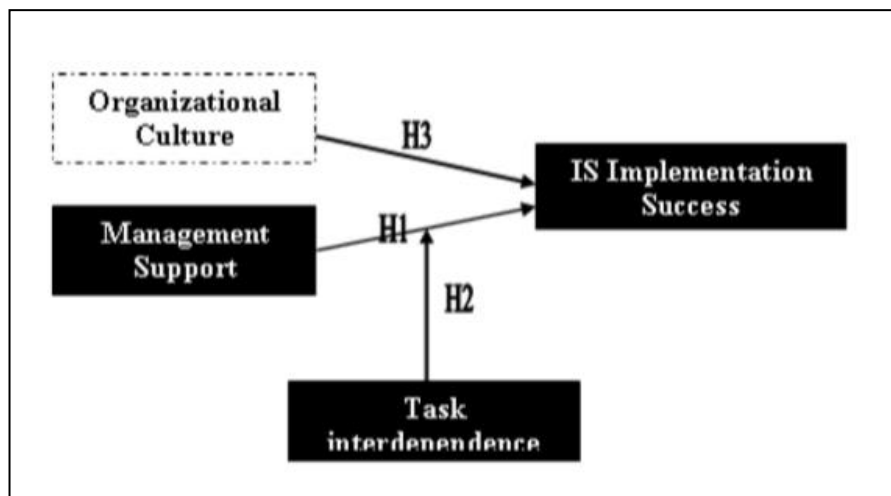
Figure 2. 1 Conceptual model success presented by Besha ,Negash ,Amoroso (2009..p.3)

According to Sharma & Yetton (2003), they proposed model to investigate the impact of met structuration action and task interdependence on the successful IS

implementation. Figure 2.2 IS implementation Success model of Sharma & Yetton (2003).
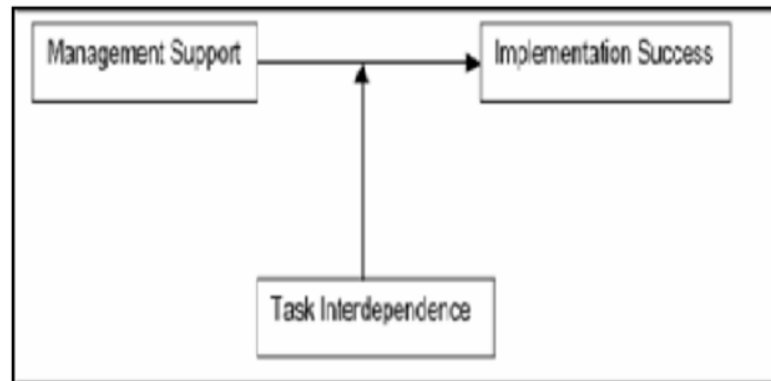
Figure 2.2: IS implementation Success model of Sharma & Yetton (2003)

2.10. Summary of literature

Key terms and concepts were the major findings from literature to construct the topic and the objectives of the study. According to a review of literature EMIS which can be defined as "*An Education Management Information System (EMIS) that brings together people, practices and technology to provide quality education statistics in a timely, cost-effective, and sustainable manner, at every administrative level, and to support selected operational functions*"(*United States Agency for International Development –USAID,2011*).

EMIS is an organized group of information and documentation services that collects, stores, processes, analyzes and disseminates information for educational planning and management (UNESCO, 2003).

According to the definition for the EMIS, all literature rationalized the importance and need for establishing an education management information system (EMIS). And also describes the different concepts, structures and development of an EMIS, describe the major features of an EMIS in terms of objectives, integration, dimensions, institutional framework and specialization and information flow.

First objective of the study is to identify and explore the major factors that lead to the successful adoption of MIS. Table 2.2 provides the summary of the factors that are focused in literature. Review of literature indicated that there are many studies that have been conducted in the field of the factors affecting MIS implementation in organizations. From the literature reviewed, these factors (Organization, Technology, People, Environment, Policy and Project) were found to be directly or indirectly influencing MIS implementations in organizations. According to the summary of the literature, most of the literature focused the organization factors than the technology and the people.

All the reviewed studies have been based on private sector organization in the Western and Middle East countries. Only one study had been carried out in Sri Lanka but with reference to government parastatals. Current study therefore looks at this aspect broadly (the factors influencing MIS adoption) at a local public sector perspective that is Ministry of Education in Sri Lanka.

According to summary Table 2.2, the organization factor is common and important for all study and technology and people factors much considered in studies. These three prominent factors were selected for the current study. The research model was built based on literature review and their validation to be done through survey and also verify whether the practical scenario these factors are really influencing education management information system adoption success. Furthermore, there are few studies that identified factors affecting Information Systems in Sri Lankan context (Vithanage & Wijayanayake 2006, Vithanage and Wijayanayake 2007, Dassanayake & Wijayanayake 2008).

Some reviewed literature introduced a feasibility assessment framework and model for the successful adoption of MIS. Therefore, the primary objectives of this research is to assess the factors that affect the successful implementation of MIS implementation of Education Ministry and also to develop a MIS adoption model. According to literature findings, Information System Implementation Feasibility assessment were done using Operational Feasibility, Economic Feasibility, Technical Feasibility and Human Factor Feasibility. The current study was able to use this factors to assess the

feasibility of the ministry in order to adopt MIS. Based on theories and literature findings, logical framework model was used to develop MIS adoption model for the ministry of education.

By undertaking literature review, it was able to gain an impression on the important aspects of the topic, identify data sources that other researchers have used, identify the relationship between concepts variables, identify ideas for further consideration, identify the methods used in previous researches on the topic, provide comparisons for this research findings, helps to work out how to answer the questions - and indeed, what questions need to be asked.

Table 2.-2: Literature Summary-Identified factors that are affecting MIS adoption by previous studies

Title of literature	Author and year	Organization factors	Technology factors	People factors	Environmental factors	Policy factors	Project
Management information system, challenges and solutions	Mehdi Babaei, Jafar Beikzad (2013)	☑			☑		
Management Information System Implementation Challenges, Success Key Issues, Effects and Consequences	Artit Kornkaew (2012)	☑					
Ten key considerations for the successful implementation and adoption of large-scale health information technology	Kathrin M Cresswell (2013)		☑	☑			
Organizational culture effect on information systems adaptation	Jane Wairimu (2013)	☑					
Proposed model for the successful implementation of management information systems in Yemeni organizations	Yaser Hasan Al-Mamary (2014)	☑	☑	☑			
Factors Affecting Successful Adoption of Management Information Systems in Organizations towards Enhancing Organizational Performance	Yaser Hasan Al-Mamary (2014)	☑	☑	☑			
Management Information Systems in Public and Private Organizations An Empirical Test	Syracuse University (2001)	☑		☑			
Changes and Challenges in the Public Sector Workplace	A Manpower White Paper (2006)	☑		☑			
The critical factors affecting E-Government adoption: A Conceptual Framework in Vietnam	Ngo Tan Vu Khanh (2007/	☑					
E-readiness: how ready are UK construction organizations to adopt IT	Eric C.W. Lou (2006)		☑				
E-Government Readiness Assessment Model	Ahmed Al-Omari and Hussein Al-Omari (2006)	☑					
A Study of How an Education Management Information System (EMIS) can be effectively implemented in the Ministry of Education in the Kingdom Of Bahrain	Ahmed Al Koofi	☑				☑	
Education Management Information Systems (EMIS)	UNICEF, Beirut (2007)	☑		☑			
End-User Computing Success Further Evidence from a developing nation	Abdulla (2002)	☑		☑			
ICT Readiness Assessment Model for Public and Private Organizations in Developing Countries	Kungwannarongkun (2011)	☑		☑			
E-Government Readiness Assessment for Government Organizations in Developing Countries	Robert Goodwin (2011)	☑		☑			
Factors Affecting Implementation of Data Warehouse	Young-Sook Lee,Dong-Man Lee(2008)	☑		☑			☑

Title of literature	Author and year	Organization factors	Technology factors	People factors	Environmental factors	Policy factors	Project
Factors Affecting Implementation of Information Systems Success and Failure	Gulçin Buruncuk, Zarife Gonca Gulser	☑			☑		☑
Factors affecting implementation of Management Information System in Selected financial cooperatives in Nairobi, Kenya	Irene Wanjiku Munene (2015)	☑	☑				
Factors Affecting the Successful Implementation of ICT Projects in Government	David Gichoya (2005)	☑	☑	☑	☑	☑	☑
Factors Influencing the Successful Adoption of Decision Support Systems: The Context of Aqaba Special Economic Zone Authority	Karak, Jordan (2011)	☑	☑	☑			
Strategies for Successful Information Technology Adoption in Small and Medium-sized Enterprises	Morteza Ghobakhlo (2012)	☑	☑				
Feasibility assessment model for successful adoption of information systems in small and medium enterprises	J.M.S.S. Jayasinghe1 and W. M. J. I. Wijayanayake (2013)	☑	☑	☑	☑		
The Influence of Human Factors and Specialist Involvement on Information Systems Success	Martinsons, Patrick, Chong (1999)			☑			
Organizational Factors that Affect the Implementation of Information Technology: Perspectives of Middle Managers in Iran	Hosein Barzekar, Mahtab Karami(2014)	☑					
The Impact of Organizational Culture on IS Implementation Success in Ethiopia: the Case of Selected Public and Private Organizations	Tibebe Besha, Solomon Negash, Donald L. Amoroso (2009)	☑					
The impact of organizational factors on management information system success	Asadi, Ahmad (2009)	☑					

3. METHODOLOGY OF THE STUDY

3.1. Overview of the Chapter

This study attempts to focus specifically on the factors that affect the successful adoption of MIS in the education sector and its ultimate goal is to develop a MIS adoption strategy for future successful MIS Implementation to enable effective and efficient management processes of the Ministry of Education in Sri Lanka.

This chapter presents the methodology used to combine a theoretical and conceptual approach, sample selection, instrument design and data collection methodology adopted in this study.

3.2. Research Questions

The purpose of this study is to present and identify factors that influence MIS Implementation in the Ministry of Education in Sri Lanka. The study would examine challenges or problems and identify the key factors affecting the successful implementation of MIS.

In order to achieve the objective of the study, the following research questions have been identified;

- Why has the implementation of MIS been a failure in the Education Sector?
- What are the key factors that need to be identified in order to achieve the successful implementation of MIS?

3.3. Research Argument

The importance of formulating a research problem was derived with the long standing information management issue in the Ministry of Education in Sri Lanka. The Ministry of Education had made several attempts to implement EMIS with the objective of digitalization of education management process. Efforts made had not been successful

and investments made towards numerous IS projects have not yielded successful outcomes and as a result, the systems are not in use. The source of research problems had generated these scenario considerations. The identified research problem will help the education sector to make policy decisions for information management. After identifying specific issues, a strategy is developed to analyze the survey results. Thus, a good strategy would be a significant concern for avoiding the failure of the MIS implementation and achieving a successful system in future.

3.4. Research Approach and Design

This research used mixed methods of research for the investigation involving the collecting of both quantitative and qualitative data, integrating the two forms of data. And also the complexity of the organization and the administrative setup, the researcher has selected hybrid/mixed approach of both qualitative and quantitative approaches to get a complete understanding of the research problem rather than using either approach on their own.

3.5. Variable

Integrating the researcher's logical belief with published research, taking into consideration 'the boundaries and constraints governing the situation, is pivotal in developing a scientific basis for investigating the research problem' (Sekaran & Roger, 2006). The conceptual framework had been developed in this study after identifying and labeling variables. Three independent variables and one dependent variable have been identified.

- Independent Variables
    - Organization
    - People
    - Technology
- Dependent Variables
    - Successful adoption of MIS

3.6.   Relationship of Variables

Three independent variables have been identified which influence the adoption of MIS either positively or negatively. The Dependent variable of this study was always associated with the change in the Independent variable. Successful adoptions of MIS may result due to a positive impact on above three independent variables. A logical explanation is illustrated in figure 3.1. Logical relationships of the dependent and independent variable could be explained as follows:

a. Successful implementation of the MIS depends on organization's readiness and acceptability
b. Successful implementation of the MIS depends on Technology readiness and acceptability
c. Successful implementation of the MIS depends on People's readiness and acceptability

3.7. Conceptual Framework

Based on prior literature, the research model for this study was designed. The three independent variables include Organizational factors, Technology and People with eleven (11) dimensions. These variables are hypothesized to influence the successful adoption of MIS. The Figure 3.1 illustrates the model.
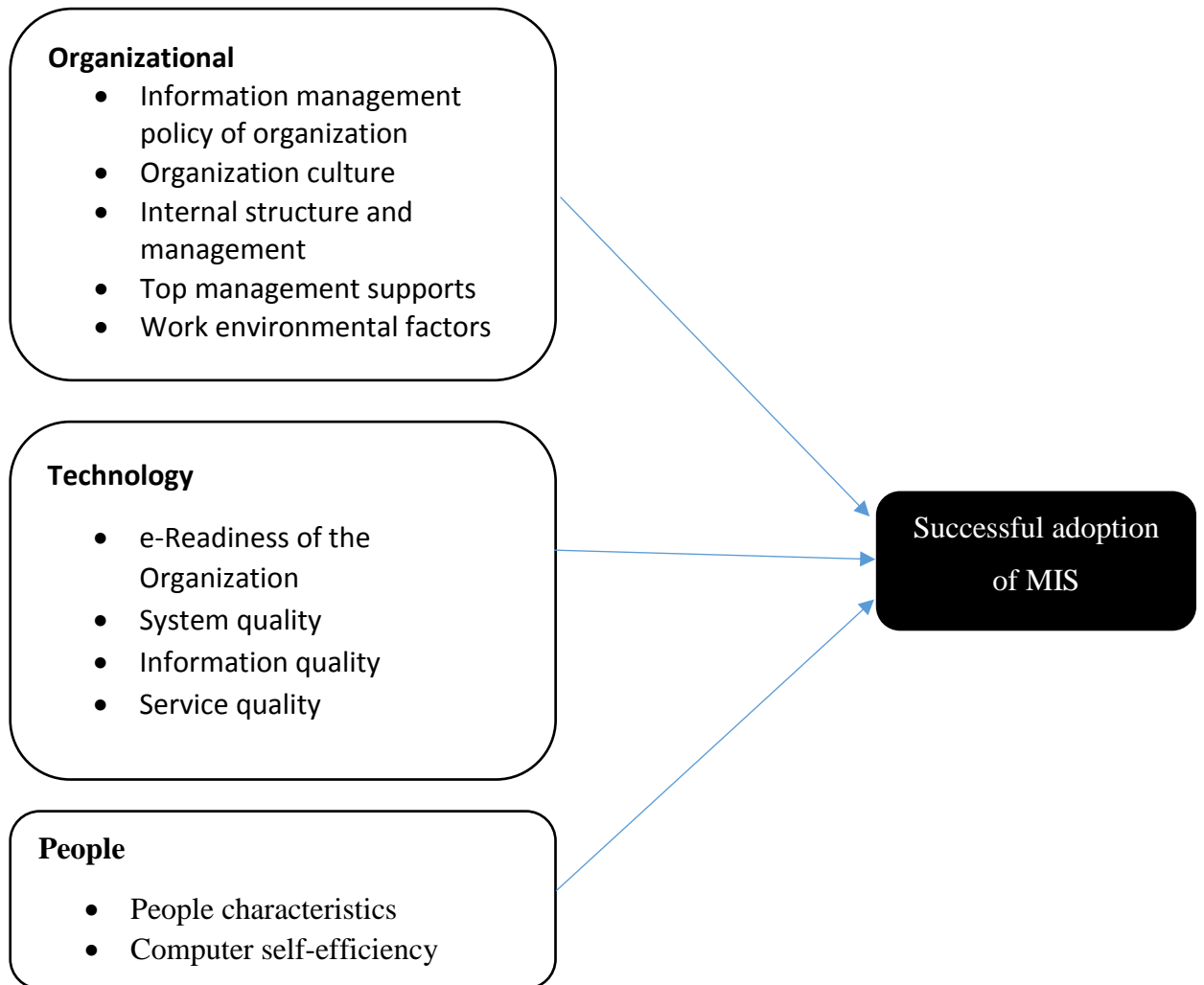
Figure 3-1 Conceptual framework

The foundation for the study has been developed, having examined the different kinds of independent and dependent variables in this study, Literature review and secondary information from the Ministry of Education helped to identify the appropriate variables. Successful adoption of MIS is explained by three independent variables. The Summary association of the previous research with selected variable had been summarized in table 3.1.

Table 3-1 Associated Literature Independent Variable

Variable	Definition	Associated Literature
Organization factors	Organizational factors are one of the most important determinants of successful projects. 'Understanding their impact and identifying them could help planning a systematic IS implementation' (Hosein Barzekar & Mahtab Karam,2014).	Jane Wairimu (2013); Indeje & Zheng (2010); Artit Kornkaew (2010); Mehdi Babaei, Jafar Beikzad (2013); Yusuf Kibet, Nahum Metto(2014); Tibebe Besha, Solomon Negash, Donald L. Amoroso(2009); Stuart Bretschneide(2015); Young-Sook Lee, Dong-Man Lee, Chang-Kyo Suh(2012); Yaser Hasan Al-Mamary(2014); Dezdar, S., & Ainin, S. (2011); Al-adaileh, R. M. (2009); Buruncuk & Gulser (2010) ; Azadi and Hassnshashi (2009); Hashim, R. (2010); Indeje Wanyama, Qin Zheng. (2010); L. Warne, D. Hart. (1996)
Technology factors	Government initiatives and policies could either 'directly and/or indirectly stimulate the development of IT infrastructure and information provision to energize faster technology diffusion' (Durodolu, 2016).	Oluwole Durodolu (2016); Kim & Kankanhalli (2009); Siegel (2008); Rivard & Lapointe (2012); Frambach & Schillewaert (2002); Yaser Hasan Al-Mamary (2014); Richard J Holden & Ben Tezion Karsh. (2010);
People factors	'Organizational innovations that need to be incorporated in work processes of an organization are of little value if they are not adopted by the employee' (Howard Harris & Gido Mapunda, 2008)	Peterson, D.K., Kim, C., Kim, J.H., Tamura, T. (2002); Yaser Hasan Al-Mamary (2014)

Table 3-2 Associated Literature Dependent Variable

Variable	Definition	Associated Literature
Successful Adoption	The successful adoption of technologies in companies are much dependent on 'technology characteristics, project and organizational characteristics user and social characteristics, and task characteristics' (Petteret, 2009).	Yaser Hasan Al-Mamary(2014); Petter, S, DeLone, W, & McLean, E. R. (2013); Park & Ciganek (2011); Kathrin & Bates (2013); Buruncuk & Gulser (2010) ; Jayasinghe and Wijayanayake (2013); Asad Abbas, Ali Faiz,Anam Fatima & Ander Avdic. (2017); B. Edingtonm, Namchul Shin. (2002); Goldfinch, S. (2007); Hisham Al-Mobaideen, Sattam Allahawiah & Eman Basioni. (2013); Isabel Candal-Vicente. (2009); Javed Ashraf, Naveed Sarfraz Khattak & Ather Mohsin Zaidi. (2010); M. Kamaruddin, R. Razali, A. Deraman. (2017); Munene, I. W. (2015); S. Zailani ,R.A. Salam. (2006); Shih-Wei Chou, Mong-Young He , Pi-Yi Chen. (2008); T Randal Curlee.Bruce T..Tonn. (1987); Wailea (2006);

3.8. Hypotheses Development

Based on theoretical and conceptual framework, the relationship has been developed between independent and dependent variables. The relationship between these variables were scientifically tested through a statistical analysis. The results of these tests offered some clues as to what could be determined either success or failure. In this research study, the researcher had selected non-directional hypotheses to postulate a relationship between the dependent and independent variables. Within the Ministry of Education or any other public or private domain no researcher has ever explored the relationship or difference among these variables and hence there is no basis for indicating direction. In order to find out whether the relationship hypothesized in the conceptual framework holds true several hypotheses are drawn.

Let:

H1: Alternative Hypotheses

H0: Null Hypotheses

Hypotheses 1

H1: There is a relationship between Technological factors and Successful adoption of MIS

H0: There is no relationship between Technological factors and Successful adoption of MIS

Hypotheses 2

H1: There is a relationship between the Organization factors and Successful adoption of

MIS

H0: There is no relationship between the Organization factors and Successful adoption of MIS

Hypotheses 3

H1: There is a relationship between People factors and Successful adoption of MIS

H0: There is no relationship between People factors and Successful adoption of MIS

3.9. Operationalization of Variables

According to Sekarn & Bougie (2006), Operationalization is done by looking at the behavioral dimension, facts, or properties denoted by concept. Which are translated in to observable and measurable elements so as to develop an index of measurement of the concept.

As a first step, definitions are presented based on previous research studies in the field of Implementation of MIS. Operationalization dimensions have been done by using observable and measureable elements. Quantitatively, measurable items or questions are adequately represented within this dimension.

Nine dimensions were tested under three independent variables to test the hypotheses. This section will review how the concept introduced to the conceptual research framework of the present study is operationally defined.

Existing literature were used to find out whether there are impotent existing sources of measures concept.

3.9.1. Organization success

Since the organizational factors are one of the most important determinants of successful projects, by understanding their impact and identifying them could help planning a systematic IT implementation ((Barzekar & Karami, 2014). In order to understand the effects and consequences by implementing IS which affect an organization and its processes, it is essential that various perspectives of impacts originated by adopting information system is described. Once an information system (IS) is introduced, IS has affected their context of use in activity system in an organization (Davis, 2009). Sociological & organizational factors affect IT adoption (Shaukat & Zafar, 2010). Influence of organizational factors on MIS success is a major factor for MIS implementation. All organizational factors (department structure, IS infrastructure & MS) are significantly correlated to the success of IS (Rezaei, 2009).

All the organizational factors (TMS, MS, Decision-making structures) are significantly correlated to the success of IS adoption (Hissein, 2007).

An organization was identified as an independent variable for this study. It represents six dimensions; requirement of information management policy of organization, organization culture, internal structure and management, top management supports and work environmental factors.

Requirement of information management policy and implementation resources of organization

Under the requirements of the information management policy implementation factors are tested by the use of five items. The items are including a necessity of information management policy, Annual budget allocations, capacity of local funds, and management needs of MIS and legal acceptance of online data. Six Likert scale categories ranging from Strongly Disagree (1) to Strongly Agree (6) had been used in the questionnaire. For example, the sample question in the questionnaire "*Information management policy is necessity for education*" is accompanied by six Likert scale categories that range from Strongly Disagree (1) to Strongly Agree (6).

Organization culture

The management information system could have been adapted well if the users' values and methods of working environment were ingrained in the system (Wiramu, 2013).

This study used six items to identify the relationship and their positive or negative influence on MIS adoption. Six Likert scale categories which range from Strongly Disagree (1) to Strongly Agree (6) have been used. For example, the sample question in the questionnaire "*Organization culture supports MIS Implementation and sustainability* is accompanied by six Likert scale categories ranging from Strongly Disagree (1) to Strongly Agree (6).

Internal structure and management process

From a previous research, Beaumaster (1999) identified and categorized problematic issues regarding the IT implementation. According to Rainey (1976), the public sector has a more complex criteria (e.g., multiple, conflicting, and intangible); managers with a less decision- making autonomy, less authority over subordinates, greater reluctance to delegate, and a more political role for top managers; more frequent turnover of top managers due to elections and political appointments; difficulties in devising incentives for individual performance and lower work satisfaction and organizational commitment. Management process issues speak of the functional operation of an organization such as budgeting, personnel and general management.

This study used five items which cover Strategic Planning, Organizational Directives, power of managers and process of current management. Six Likert scale categories ranging from Strongly Disagree (1) to Strongly Agree (6) have been used. For example, one sample question in the questionnaire "*Current data management process is organized* carries six Likert scale responses ranging from Strongly Disagree (1) to Strongly Agree (6).

Top management supports

Management support is another critical factor for successful IS Implementation. According to Little & Gibson (1999), management support is positively related to successful implementation of the information systems in organization. Managers' awareness of benefits, provision of resources, encouragement and support given to the respective team for IT implementation and new technology interventions are more important factors determining the successful adoption of Information System.

This study used four items which include Strategic Planning, Organizational Directives, power of managers, and process of current management. Six Likert scale categories which range from Strongly Disagree (1) to Strongly Agree (6) have been used. For example, one sample question in the questionnaire "*Management provides necessary help and resources to implementation system*" is accompanied with the responses that range *from* Strongly Disagree (1) to Strongly Agree (6).

Work environmental factors

The public sector work environment is different from other business organizations basically due to their objectives. 'Less market exposure (and therefore more reliance on appropriations) resulting in less incentive for productivity and effectiveness, lower allocative efficiency and lower availability of market information; more legal and formal constraints; and higher political influences, including impacts of interest groups and need for support of constituencies' (Rainey,1976).

This study used seven items which include Strategic Planning, Organizational Directives, power of managers, and process of current management. Six Likert scale categories that range from Strongly Disagree (1) to Strongly Agree (6) have been used. For example, one sample question in the questionnaire *"Management provides necessary help and resources to implementation system"* is accompanied by six Likert scale categories ranging from Strongly Disagree (1) to Strongly Agree (6).

3.9.2. Technology

According to Beaumaster (2002) MIS concentrate on the automation of many business activities that aim to provide better methods of planning, reporting and operation control. Therefore, MIS which is often referred as "information system (IS)", had attempted to 'provide methods to manage problems and situations around all perspectives of the management of information' (Theiruf, 1994). Moreover, MIS is a facilitator for an organization and it supports management activities. 'The technological factor has a positive effect on IS integrations successful implementation' (Hussei, 2007). MIS implementation, however, is high priced with costly assets, thus this implementation project requires detailed planning in terms of its design, implementation and operation processes.

Technology is identified as an independent variable for this study. It represents two dimensions. E-readiness, System and Information quality of existing systems are two dimensions in this technology variable.

E-Readiness of the organization

Issues pertaining to 'technical systems are mainly those referring to hardware and software considerations of information technologies' (Artit Kornkaew, 2012) Furthermore, this study considers Existing System, Standardization and Compatibility are Categorized as an Information System (IS) Implementation Challenge Issues. Major barriers could be met in the adoption and diffusion of e-government services depending on the readiness of a country in terms of ICT infrastructure and deployment (Ibrahim A. Alghamdi, Robert Goodwin, Giselle Rampersad, 2011)

This study used five items which comprise of Technological Infrastructure, Human resources, use of technology within the organization, Assessment of existing systems and information quality. Six Likert scale categories ranging from Strongly Disagree (1) to Strongly Agree (6) have been used. For example, one sample question in the questionnaire *"Technological infrastructure has been established (network, connectivity, etc.)* is accompanied with the responses that range *from* Strongly Disagree (1) to Strongly Agree (6).

Assessment of existing Education Management Information System (EMIS)

According to Petter (2009), information quality is the "*desirable characteristics of the system outputs".* As Petter explains relevance, understandability, accuracy, conciseness, completeness, understandability, currency, timeliness and usability are major factors which influence the success and acceptance of technology.

In technological dimension, three factors were tested; they were system quality, information quality, and service quality. Existing system were assessed using 14 items each with six Likert scale categories that range from Strongly Disagree (1) to Strongly Agree (6). For example, the sample question in the questionnaire "*Information in EMIS is accurate and reliable*", "*NEMIS information useful for decision making*" are accompanied with the responses that range from Strongly Disagree (1) to Strongly Agree (6).

3.9.3. People

Hasan (2014) has identified two variables in people dimension that are computer self-efficacy and user experience. Computer self-efficacy refers to an individual's belief that he or she has the skills and abilities to accomplish a specific task successfully (Zhao, 2010).

In this research study, people variable has two dimensions, namely computer self-efficacy and people characteristics of the organization.

Measure Computer Self-efficiency

According to Igbaria & Iivari (2000) experience is measured by using items such as: I have experience in using the systems, I have experience in using spreadsheet, I have experience in using word processing, I participate in feasibility studies, I participate in requirements analysis, I have experience in using financial modeling, I have experience in using programming languages and I participate in design of computerized information systems.

In Computer Self efficiency, three factors are tested, they are computer usage internet and usage, analytical capacity by using computer. Existing system are assessed using 4 items each accompanying six Likert scale categories that range from Strongly Disagree (1) to Strongly Agree (6). For example, the sample question in the questionnaire "*I use Email and Internet for office work*" carries the responses that range from Strongly Disagree (1) to Strongly Agree (6).

People characteristics

Babaei & Beikzad (2014), had explained the position, aim, role, definition are existing barriers and also these humanistic factors are challenges and problems for implementation of management information systems. Individual differences, tasks, & decision models have an effect on user acceptance of DSS (Liu & Chen, 2008).

In People characteristics dimension, 6 factors were tested, they are experience, development participation, perception, role and responsibility and accountability.

Existing system are assessed using 14 items each accompanied by six Likert scale categories that range from Strongly Disagree (1) to Strongly Agree (6). For example, the sample question in the questionnaire "*I have an experiences in using various types of IS*" carries the responses that range from Strongly Disagree (1) to Strongly Agree (6).

3.10. Sample design

The Ministry of Education has three major administration levels for management and operation. In these three levels, the managers are the users of the MIS, since they make decisions on a daily basis based on current levels. Therefore EMIS was expected to be used as a tool in decision making and monitoring processes by all these managers that were selected as respondents for the survey. As illustrated in Figure 3.2 depicted bellow, the Ministry, Province and the Zonal offices are three major levels in project and programme implementation. Hence, these three levels have been selected for the study.
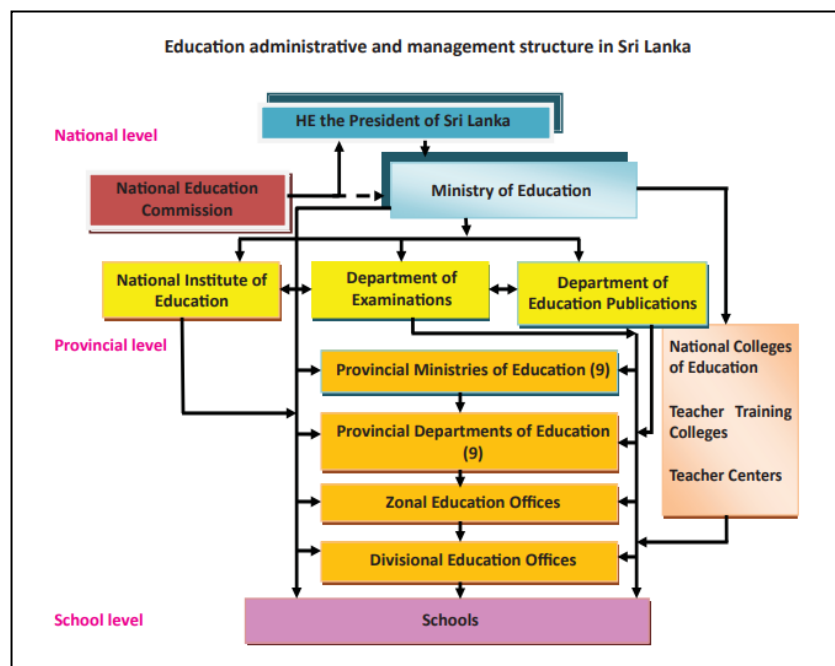
Figure 3.2. Education administrative and management structure in Sri Lanka

Managers in each level should be the director holding the qualification of Class I for the post. With the availability of the qualified Class I positions in the country Class II and Class III level directors work for some branches, subject area and zonal level office as head of the department or division. Senior management in the Ministry consists of the Secretary, five Additional Secretaries and five Senior Assistant Secretaries, and CFO, and DG Finance. This research has selected an exhaustive sample for this study which includes 198 respondents.

The managers were therefore key sources of data that was duly analyzed and used to quantify reasons for the factors that affect the implementation of the system in their respective organizations at different levels of administration. The senior members of management were also interviewed as they were responsible for the policy making, decision making, funding, implementation and use of the system.

According to the statistics report published by the Ministry of Education, the administrative system of education is illustrated in Table 3.3 bellow.

The purpose of administering two questionnaires for two target management groups was to establish their perceptions with regard to their respective functions and areas of responsibilities:

- Directors at Ministry of Education, Provincial Education Department and Zonal Office who are involved in planning, administration and design, development, and implementation stage of Information Systems
- Additional Secretaries and Senior Additional Secretaries who are involved in policy level decisions and policy making processes. Table 3.3. Shows a number of administrative units in the education systems

Table 3-3 Administrative System of education

Administrative system of education

Table 1.1 Districts, Education Zones and Education Divisions by province, 2016

Province	No. of districts	No. of education zones	No. of education divisions
Western	3	11	38
Central	3	15	40
Sourthern	3	11	39
Northern	5	12	35
Eastern	3	17	48
North Western	2	8	31
North Central	2	8	30
Uva	2	9	23
Sabaragamuwa	2	7	27
Sri Lanka	**25**	**98**	**311**

source : Annual School Census, 2016

According to the above statistics, 98 zonal offices are available in the country and the survey has covered all 98 offices in this study.

Table 3. 4 Selection of sample

Level	Designation	Sample	Data collection methodology
Ministry of Education	Additional Secretaries	5	Interview
	Senior Additional Secretaries	5	Interview
	Director Planning	1	Interview
	CFO	1	Interview
	Branch Directors	49	Survey
Provincial Department of Education	Provincial Director	9	Survey
	Additional Provincial Director	9	Survey
	Director Planning	9	Survey
Zonal Education Office	Director	98	Survey
Total		**186**	

3.11. Method of data collection

The target population of this research study was the top level managers in the Ministry of Education. Data collection has been conducted using both primary and secondary methods to achieve research objectives and ensure the reliability and validity of the results.

3.11.1. Source of data

This research has used two major approaches to collect data on the situation, problems and the perceptions of the three major levels of education managers on EMIS Implementation.

- Primary sources of data
  - Questionnaire survey (Online and Manual)
  - Semi Structured Interview
- Secondary sources of data
  - Literature review
  - Documents and records at the Ministry of Education (Eg: EMIS proposal, Audit reports etc.)

Primary data collection

Both interviews and a questionnaire (Appendix B) survey have been conducted to collect the primary data in order to achieve the objectives of this study. The survey has included all levels of education management. Both online and offline questionnaire had been distributed among the 186 top level directors at the Ministry, Provincial and Zonal offices. Semi Structured Interview methods combining a pre-determined set of open questions with the opportunity for the interviewer to explore particular themes or responses was used to collect data from senior policy level management staff at the Ministry of Education.

Secondary data collection

Information available through audit reports and literature, have been collected as secondary data of this study. Ministry level documents and records which were available on EMIS status and problems identified by the annual auditing, have been included in the secondary data collection.

Previous literature was a major source to develop the conceptual framework and to identify variables, instrument design and methodology selection of this study.

Reviewed literature created a foundation on which the theoretical framework for the current investigation had been built.

3.12. Instrument design

Pre-formulated questionnaires were major instruments for this study which consists of a number of questions to measure variables of interest.

The questionnaire had three main variables namely, Organization, People and, Technology. Each variable has few dimensions and grouping the questions under specific parts, allowed the participants to focus and follow the thought process of the research.

The identification of information required has been done based on the objective of the study. Three major independent variables have been identified for this study. Based on the relevance of the study these three variables consists of nine dimensions. They are:

Table 3. 5: Questionnaire design based under three variables

Variable	Sub Factors/ Dimensions	No of Questions	Likert Scale
Organization	Requirement information management policy and resources	5	6 Point
	Indication of Organization culture and support for MIS Implementation	6	6 Point
	Assessment of Internal structure and management	5	6 Point
	Indication of the level of top management support for IS Adaptation	4	6 Point
	Assessment on work environmental factors	7	6 Point
	Assessment of e-Readiness of the Organization	5	6 Point
People	Assessment of people characteristics of the organization	9	6 Point
	Computer Self efficiency	4	5 Point
Technological	Assessment of qualities of the current Education Management Information System (EMIS/EPMIS)	8	6 Point
	Assessment of the level of service quality that they receive from the technical support team	7	6 Point

In summary, this survey encompassed nine dimensions with 60 items. These 60 items are not related to each other as each of the three dimensions are independent. Except for computer self-efficiency, all other, Six Likert scale measures are used to measure the perceptions of the respondents.

For members of the senior management level, 15 questions have been used to conduct semi structured interviews. More in-depth information about the above three variables have been collected by using structured questionnaire. The questionnaire mainly be focused on the current management process, availability of information management policy, infrastructure and challenges for the operationalization of the MIS. The questions were focused on factors and variables that had surfaced during the survey which were considered relevant to the objective of the study. The same questions were developed to collect data from senior managers through interview. Through this process new factors and missing areas have been identified. Through this process, the comparison of perceptions between the top level and other management levels have been accomplished.

3.12.1. Defining target respondents

The survey questionnaire has been disseminated among all top level managers who had been selected for the survey at three different levels as categorized in Table 3.5. The interview questionnaire had been used to collect data from the senior management.

3.12.2. Content of the questionnaire

Contents of the questionnaire have been decided based on the evaluation of the objectives of the study and the variables identified for the study. 'The wordings, categorization of variables, general appearance of the questions are three major guidelines to be followed when developing questionnaires of a study' (Sekeran, 2006). Contents and purpose of the questions were decided based on the nature of the variable. These questionnaires covered subjective matters, respondent beliefs, perceptions and attitudes while the objective variables such as Age, Education level, Designation of

respondents. A pilot survey had been conducted with managers and relevance, responsiveness and applicability of the questions had ensured.

3.12.3. Length of the questionnaire

The major objective of this study is to develop a MIS adoption strategy for successful Implementation. To achieve this major objective of the study, questions have been designed under nine dimensions as shown in Table 3.5. A pilot survey has been conducted to check the validity of the questions and accordingly the length of questionnaire has been adjusted.

3.12.4. Pre-test of the questionnaire

Draft questionnaires have been pilot tested with 30 managers to collect their opinion regarding the wordings, contents, meaningfulness, relevance, and clarity of the scale. Cronbach's Coefficient Alpha was the method used to measure the reliability of the questionnaire between each dimension and the meaning of the items of the questionnaire. Appropriateness of the questions and their comprehensiveness had been tested through a pre testing process.

Interviews questionnaire had been tested with a few members of the senior management and the validity and relevancy of questions have been assured. Some additional information from the group of participants were collected and appropriateness and reliability of the items had been tested.

3.12.5. Development of the final survey form

Final questionnaires (Appendix B) for the collection of qualitative and quantitative data have been duly developed following steps described above.

3.13. Data Collection Process

Primary data was collected through both the interview and the questionnaire survey. Responses collected through interviews and questionnaires are strongly correlated with each another, while it has ensured the goodness of the collected data.

3.13.1. Interview

A predetermined set of questions, using the same wording and order of questions as specified in the interview schedule has been conducted with 12 senior managers. Appendix C provided all questions were used in this survey. One of the main objectives of this structured interview was that it collected uniform information, which assures the comparability of data. This research had been set out with the objective to develop a theory, based on the factors that influence the broad problems of MIS Implementation and to find as answer to the research question.

Major objectives of this research was to analyze the problems and interviews sought to elicit more in-depth information on the problem. Which were helped to identify the critical problem as well as to determine the ways of solving it.

3.13.2. Questionnaire survey

The survey questionnaire was a major instrument that collected 90% of data to achieve the research objectives. 186 managers had under taken for the survey from three different levels of education management and monitoring. Appendix D has been summarized the all responses in current study.

An online survey form had been created and a Google online form tool had been used to design it. 109 geographically scattered locations in the country had been covered and online questionnaires had been shared among from the above locations. Data based on a Likert scale had been obtained from the survey in which six point scale measures were applied. A neutral point in the scale of the questionnaire has been eliminated to protect the credibility of the research responses.

3.14.   Data Analysis

Following the data collection from representative samples through the survey, questionnaire data entering, data preparation (coding and checking for errors) tasks were performed. This study had followed online and off-line (Manually Collect data through questionnaire form) to collect quantitative data.

Qualitative data were collected through an interview process, while coding and summarizing of the data have been done systematically.

Data processing has been done by using SPSS software. Excel Application software was used for coding and error checking. Assigning numbers to participant's responses was done using the above application packages. Database was developed after this process.

Data transformation, changing numerical representation of quantitative data in to ordinal numbers had been duly accomplished.

3.14.1. Testing measures of goodness

It is imperative to measure the validity of operationally defined variables and applying different scaling techniques. Consequently, operationally defining perceptual and attitudinal variables were tested in order to measure them accurately. Reliability of the items were tested to measure as to how well the instrument that was developed to measure the particular dimensions and variables. Content validity had been tested to measure the set of items in each dimension. Cronbach's alpha was used to assess the goodness of dimensions.

3.14.2. Information presentation

Information which was subjected to both quantitative and qualitative analysis is presented by the use of a different approach.

Quantitative data analysis

The visual summary of the information had been generated using SPSS and various statistical techniques used for getting a feel for the data.

1. Descriptive statistics for the dimension, items generated in obtaining the summary of data analysis
2. Frequency table generated to depict percentage and frequencies
3. Bar chart and Pie Charts used to visually to display information

4. Central tendency of the variables and items have been done using the mean, median, mode

5. Variability of the set of observations had been made measuring dispersion techniques of range and variance

6. Relationships of the variables has been tested using the correlation analysis. Direction, strength, and the significance of the relationship among variables that were measures listed by using correlation analysis.

7. Factor analysis had been done by the use of principal component analysis

Qualitative Data analysis

Senior management interview data was in the form of word. All questions were open-ended and had wide variety. In this research study the questionnaire was designed in a semi structured method to get a responses pertaining to specific dimensions. Policy level questions and some validation questions of the qualitative data have been collected from the interview process. The objective of the research was accomplished describing phenomena, quantifying them, or identifying specific problem and evolving the factors that influenced the problems or finding answers to research questions.

There are a few techniques applied to analyze this quantitative data. Information was then tabulated and presented in the data analysis. Some of the analysis techniques used are as follows:

1. Data reduction had been concluded coding, re- arranging the qualitative data.

2. Unit analysis

3. Categorization of data analysis was used to examine the frequency of data to create frequency summary tables

4. DATA ANALYSIS AND INTERPRETATION

4.1. Overview of the Chapter

This chapter will present data analysis for the empirical findings of the study based on the theories mentioned in the research framework. The analysis of data emphasizes the information related to the research questions in this research.

This chapter provides a detailed analysis of the statistical results obtained from the present study. Results of the hypotheses test are a major part in this chapter while both quantitative and qualitative data analysis techniques were used to derive results that lead to achieve the objectives.

4.2. Flow of data analysis

The major objective of this research study was "*to develop a MIS adoption strategy for its successful Implementation at the Ministry of Education*". Two supporting objectives have facilitated the achievement of the main objective of this study which are "*to identify and explore the major factors that the lead to successful adoption of MIS*" and "*to assess the feasibility of the adoption of MIS at the Ministry of Education*". Finally the study finding were used to answer the research question which is "Why has the implementation of MIS been a failure in the Education Sector?" To achieve the research objective three variables had been identified after an in-depth analysis of the previous study. Research data were collected using the mixed model that uses both quantitative and qualitative methods.

Data analysis was conducted by using the both quantitative and qualitative statistical method to gain insights based on data. Data reliability testing, descriptive statistical analysis, correlation analysis and hypotheses testing (t-Test), the principal component analysis were used to achieve the final objectives. Figure 4.1 presents the flow of the data analysis.

Part one of the data analyses presents results derived by the use of different statistical methods and identified factors that affect MIS adoption in education. Part two of

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Chapter 4 is presents the feasibility assessment of the ministry for the adoption of the information systems for the future. Quantitative and qualitative data analysis techniques were used to derive results. Figure 4.1 depicts the flow of analysis used by the current study. Qualitative information was used to validate the results generated in the quantitative analysis.
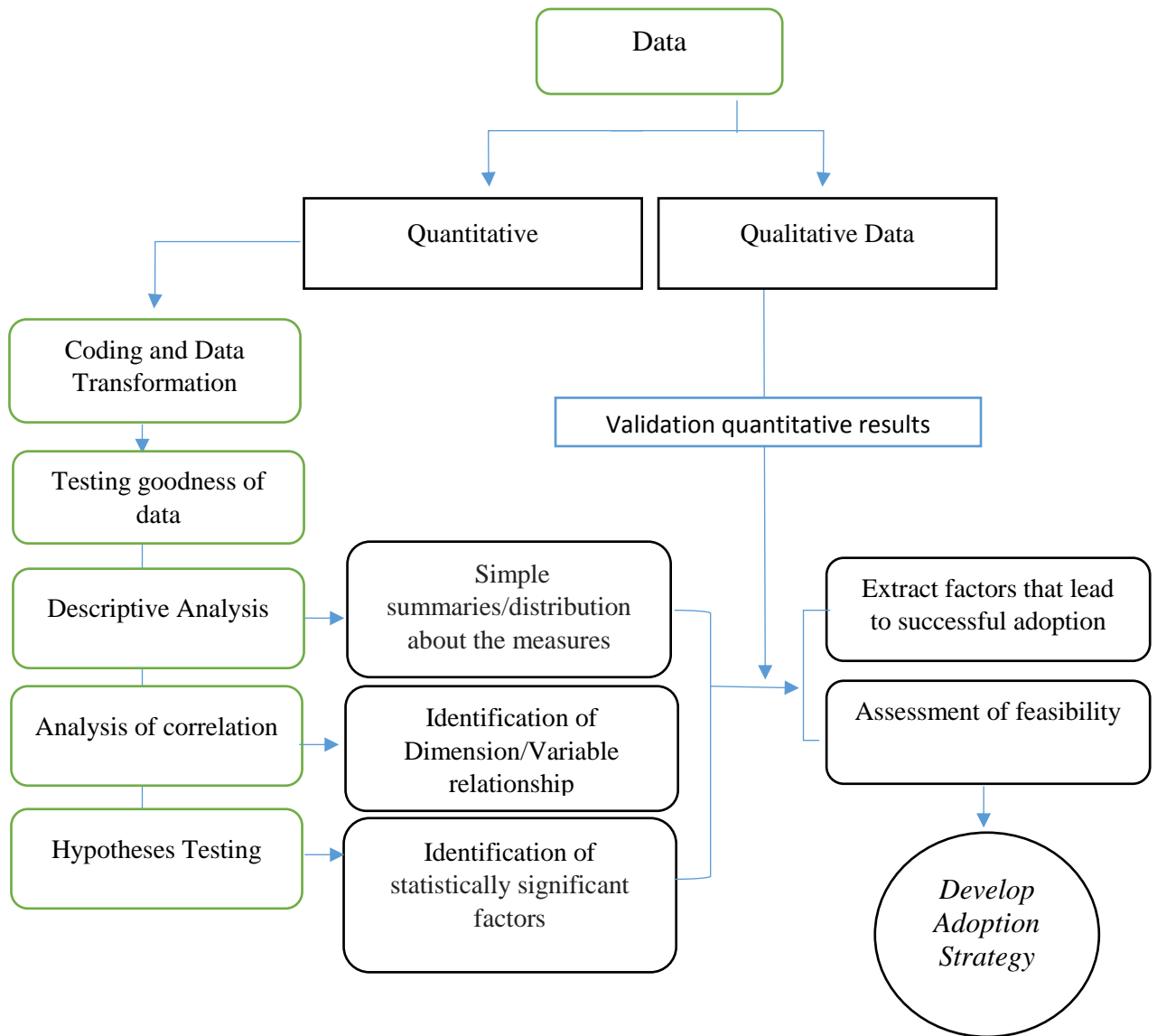
Figure 4.1 Flow of data analysis

4.3. Descriptive Statistics Analysis

4.3.1. Data collection

Data was collected from 186 respondents in three different administrative levels at the ministry of Education in Sri Lanka. Data collected through administering an online questionnaire and through a hardcopy questionnaire, were submitted for analysis and interpretation results. Two months had been spent on data collection for the current study. Pattern of responses over a two month period is presented in Figure 4.2.
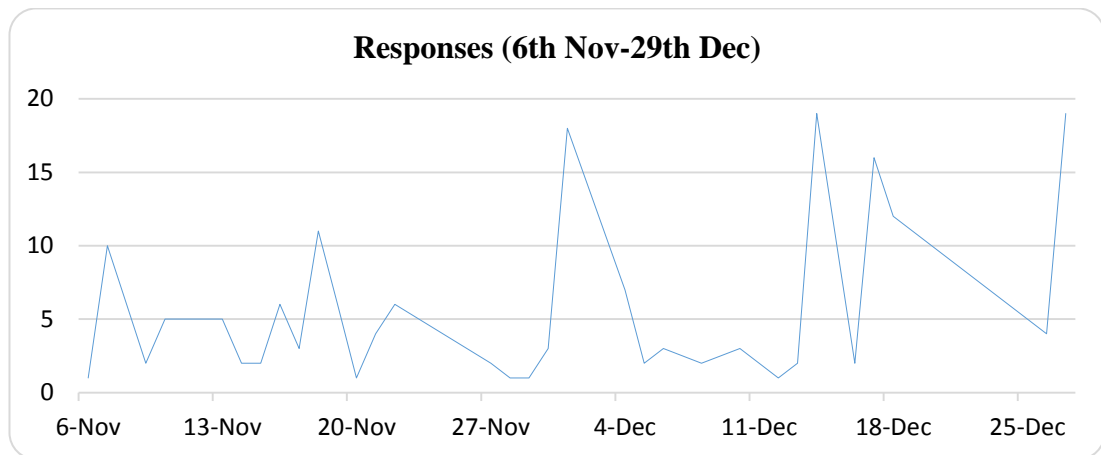
Figure 4.2: Variation of the responses from 6th November to 29th December 2017

4.3.2. Reliability Test

To achieve the main objective of this research, goodness of data were verified by testing both consistency and stability. Goodness of data was tested by the use of reliability and validity testing of all items in respective dimensions. Cronbach's alpha is the reliability coefficient used to indicate how well the items set in this study are positively correlated to one another.

4.3.3. Pilot Survey

A preliminary survey was taken of the 30 respondents who participated before finalizing the items in the questionnaire. There are nine dimensions and the reliability of each dimension was tested. According to Sekaran (2006), reliability less than 0.6

are considered as poor, those in the range 0.7-0.8 range, are acceptable, and those over 0.8 are considered as good. Hence, internal consistency reliability of the measures of this study were over 0.7 and therefore at an acceptable level for all measures.

Table 4.1. Reliability of the pilot survey

SN	Dimensions	Number of items	Cronbach's alpha
1	Requirement information management policy and resources	8	0.7635694042
2	Organization culture and support for IS Implementation	8	0.7860547392
3	Internal structure and management	8	0.8560366846
4	Top management supports for IS Adaptation	6	0.8841825769
5	Work environmental factors	6	0.9162077177
6	Assessment of e-Readiness of the Organization	6	0.9504626119
7	Assessment of the people characteristics of the organization	8	0.9193078483
8	System quality of existing Education Management Information System (EMIS)	7	0.7597015752
9	Service quality that was received from the EMIS technical support team	8	0.9661026083

Table 4.1 depicts "Information management policy" and "Organization Culture" were less than 0.8 of Cronbach's alpha value for the pilot survey, according to the validity of the results.

Based on the pilot survey some items of each dimension were removed whose validity was not significant, inconsistent and stability was not weak. The length of the questionnaire was shortened after the pilot survey, based on the results yielded in the reliability analysis.

4.3.4. Reliability analysis for survey

Reliability concerned with the findings of the research, if they can be repeated, they are considered to be reliable. In other words, reliability measures the extent to which conclusions could be drawn and repeated, if the research is done again (Ghauri, 2007).

For the current survey data, a reliability test was carried out for the entire sample of 186 respondents. There are three independent variables with nine dimensions while reliability calculation was done for each dimension and finally tested for variable. For the final survey, reliability calculation was carried out for 59 items in the survey.

Table 4.2: Reliability test for independent variable of organization for 186 respondents

SN	Variable	Dimensions	Number of items used to measure	Cronbach's alpha
1	Organization	Requirement information management policy and resources	5	0.763569
2		Organization culture and support for IS Implementation	6	0.738889
3		Internal structure and management	5	0.705166
4		Top management supports for IS Adaptation	4	0.777926
5		Work environmental factors	7	0.793216
	Cronbach's alpha value for variable of organization		27	0.854878

As illustrated in Table 4.2, organization variable had been tested using 27 items and five dimensions. All dimensions and organization variables have passed the reliability test with a score above 0.7 Cronbach's alpha coefficient.

Table 4.3. Reliability test for independent variable of People for 186 respondents

Variable	Dimensions	Number of items used to measure	Cronbach's alpha
People	People characteristics	9	0.758491
	Computer self-efficacy	4	0.829474
Cronbach's alpha value for variable of people		13	0.793921

Table 4.4. Reliability test for independent variable of Technology for 186 respondents

Variable	Dimensions	Number of items used to measure	Cronbach's alpha
Technology	e-Readiness	5	0.857694
	System Quality	4	0.926740
	Information Quality	4	0.936247
	Service Quality	6	0.918655
Cronbach's alpha value for variable of people		19	0.937985

4.3.5. Demographic Analysis

The Ministry of Education operates mainly in three major different levels for resource allocation, decision-making and other administration, which include National (Ministry of Education-MoE), Provincial (9) and Zonal (98). Data collection has been completed in all three different levels and it has involved 53% of respondents from zonal level, 19% respondents from provincial level and 28% respondents from national level. Figure 4.3 presents the distribution of respondents by administration level.
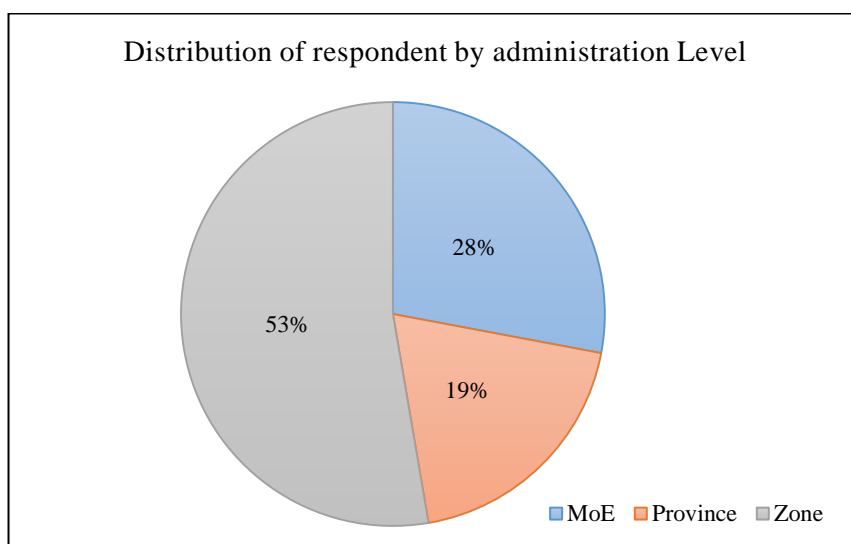
Figure 4. 3. Respondents by level of administration

Age group

When considering the age distribution of the respondents, current survey's respondents were categorized into four different age groups while lowest age of manager starts at the age of 25. This age group is generally associated with their current designation. 14% of the respondent are in the age group of 25-35, 36 % are in the age group of 36-45 while 33% represent the age group of 46-55. Only 17% of respondents are over 55 years. Due to the shortage of qualified personnel of class (I) and class (II) level in the country, some zonal offices in remote areas deploy young assistant directors as zonal director of their respective zones. Therefore, according to the survey, respondents 14 % of the directors are in the age group of 25-35. Figure 4.4 illustrates the respondents by their age groups.
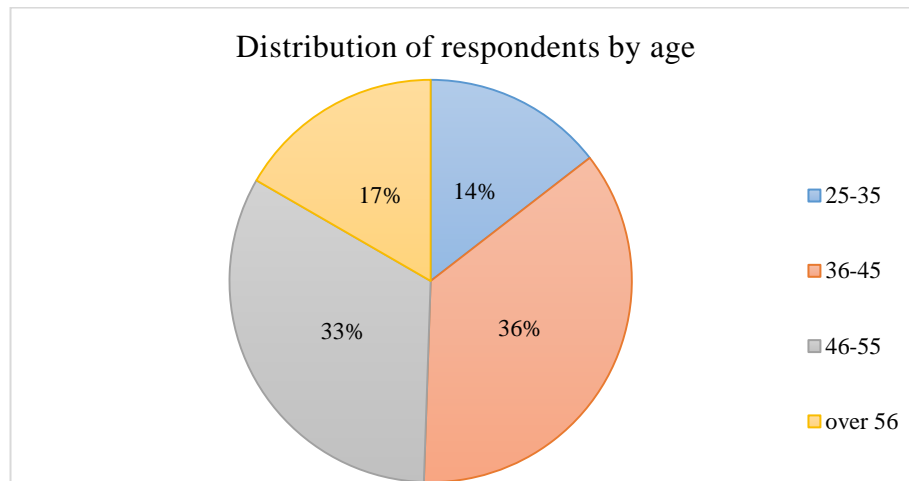
Figure 4.4. Distribution of respondents by age

Gender

Analysis of the results of the survey is presented in Figure 4.5 which depicts a good representation of gender composition. According to data, 54% are male respondents while 46% are female respondents. Gender inclusiveness of this survey has been very high and a difference can be seen at ministry level, as female representation (58%) for top level management positions exceed that of male representation. However, the results of this survey indicate a larger male representation of 78% in provincial level management positions than female managers.
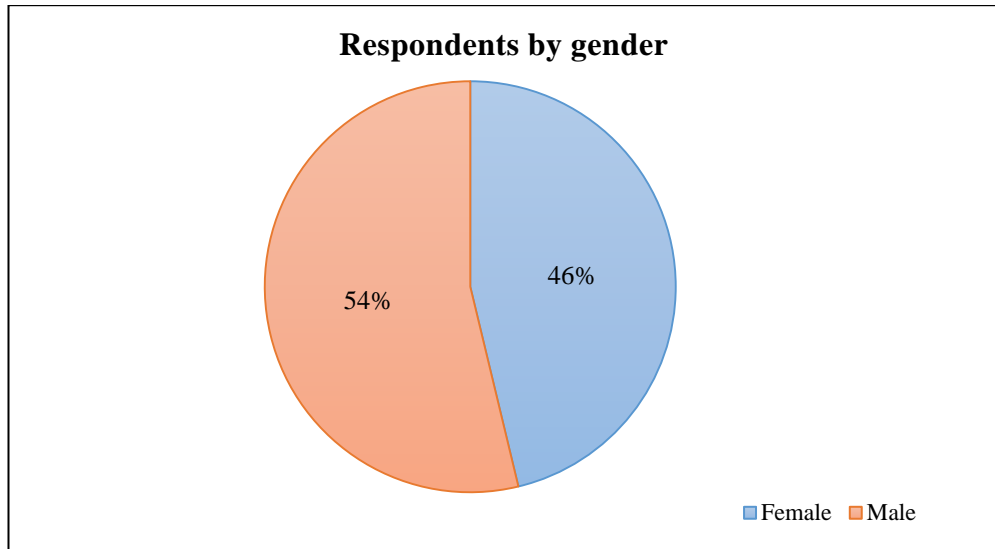
Figure 4.5. Distribution of respondents by gender

Designation

Even though managers work as a director in current position at the corresponding level, respondents were heading five different designations. As per the results, 25.8% were directors and 30.7% were deputy directors, 33.1% were assistant directors while only 5.5% additional zonal directors while 4.9% were additional provincial directors. According to the SLEAS circular (minutes) the post of director is meant for those who have qualified at "Class I" level, but due to the shortage of officers holding "Class I" and "Class II" level qualification, officers holding "Class III" level qualifications were appointed for the above post. And class (III) level assistant directors are covering up duties at this position in zonal and provincial level planning and monitoring subjects. As per results shown in Figure 4.6, 55% of the respondents are directors.
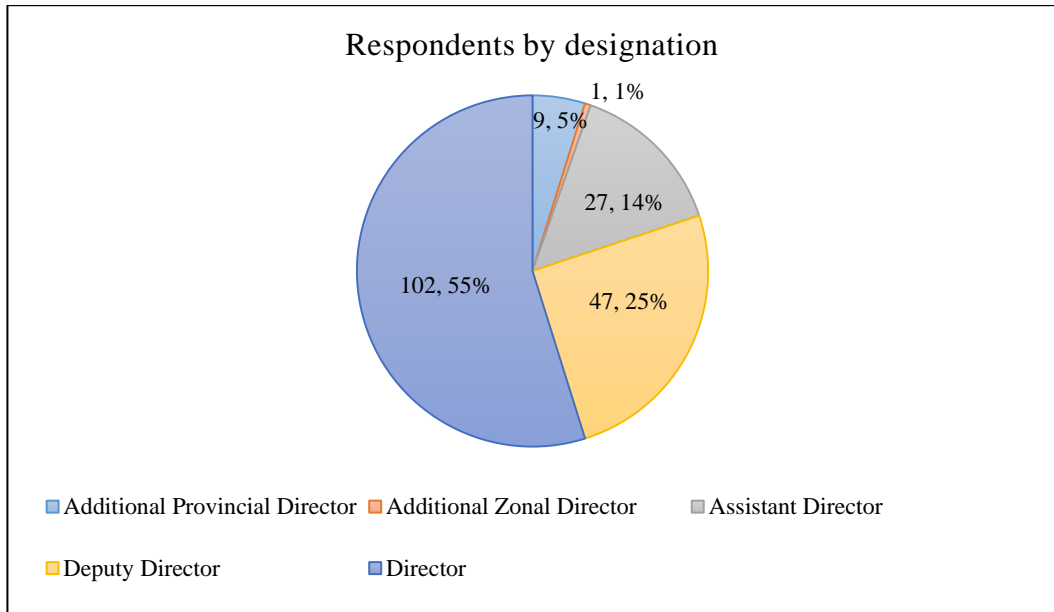
Figure 4.6: Respondent by designation

Education Qualifications

The educational levels of respondents are presented in Figure 4.7. In terms of education service management minutes and qualifications required for director post is Class I, all respondents of this survey have higher qualifications than the degree level. Among them 47.9% are graduates and 46.6 % have earned their master degree while 5.5% are qualified with Post Graduate Diploma in Education Management. This is a good sample for management level research and 99% of respondents possess above degree level educational qualifications. The degree is a basic educational qualification while other postgraduate and diplomas are essential qualifications for promotion to higher classes. This rule is reflected in the survey data since 80% directors have qualifications at degree level or above.
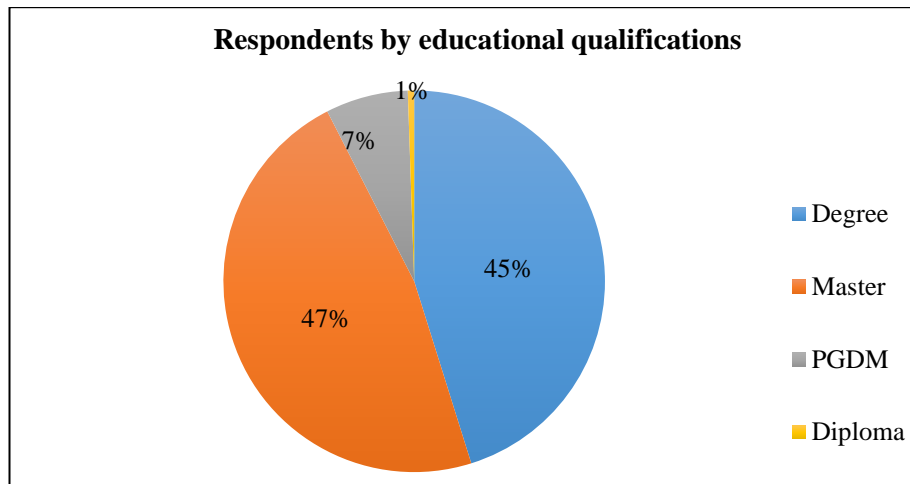
Figure 4.7. Respondents by level of education

A demographic data analysis for senior management

Figure 4.8 presents the interview sample by gender and designation. As per the demographic analysis, the population comprises of 5 (42%) female and 7 (58%) male. Four major categories were represented at the interview.
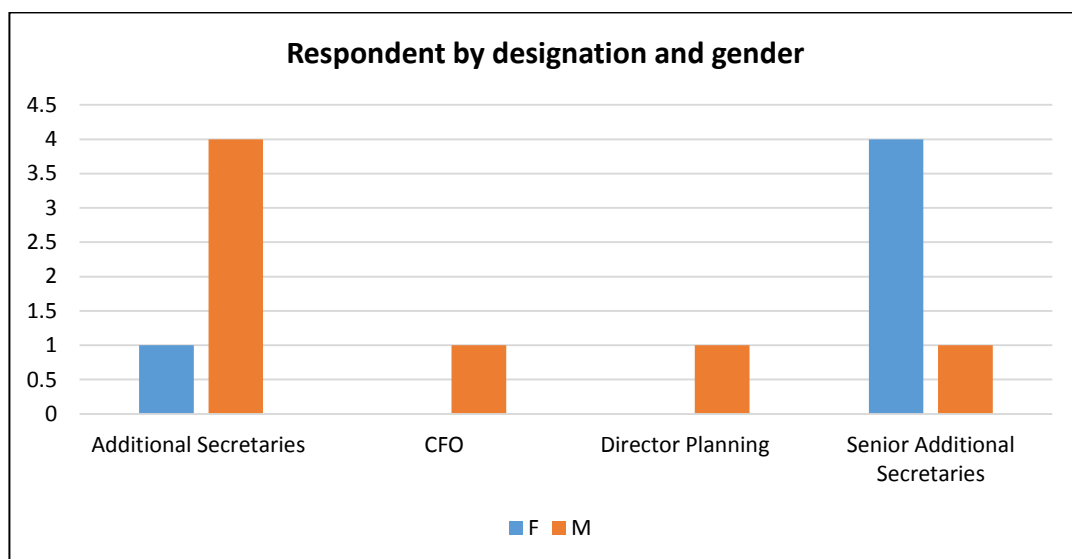
Figure 4.8. Respondents by designation and gender

4.3.6. Computer competency assessment

Computer self-competency and user experience of top level managers are more important factors for the Information systems implementation success and sustainability (Al-Mamary, 2014).

This study had been tested each respondent's capacity and usage of computers in his or her office work. According to results, 78% of the respondents are using computers for their office work and which could be considered a significant level for a public sector organization. The results yielded by the assessment of distribution of computer usage of respondents were positive and left skewed distribution as shown in Figure 4.9. In the current survey, computer self-efficiency was measured with three questions *"I use computers in office work", "I use Email and internet for office work" and "I can manage excel database and analyze data.* To capture the managers capacity on computer skills a five point Likert scale ranging from "*Not at all*" (score of "1") to *large extent* (score of "5"), was used. Responses indicated the respondents' computer literacy and usage leaned more towards a 'large extent' and the analyzed results are illustrated in Figure 4.9. Only 2.7% were not using computers for office work and 6.5% of managers use computers to a small extent. This could be negligent in comparison to the positive level of computer self-efficiency of managers in education.
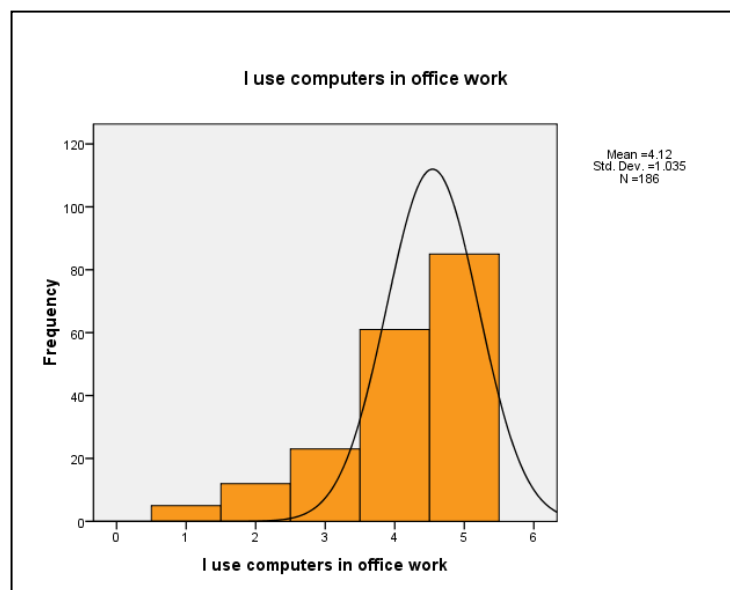
Figure 4.9.Distribution of usage of computers

According to survey results, computer usage by their designation was at an acceptable level for a promising implementation of MIS support environment. Except for a small percentage of directors and deputy directors, all other respondents possessed the knowledge to use computers in office work.
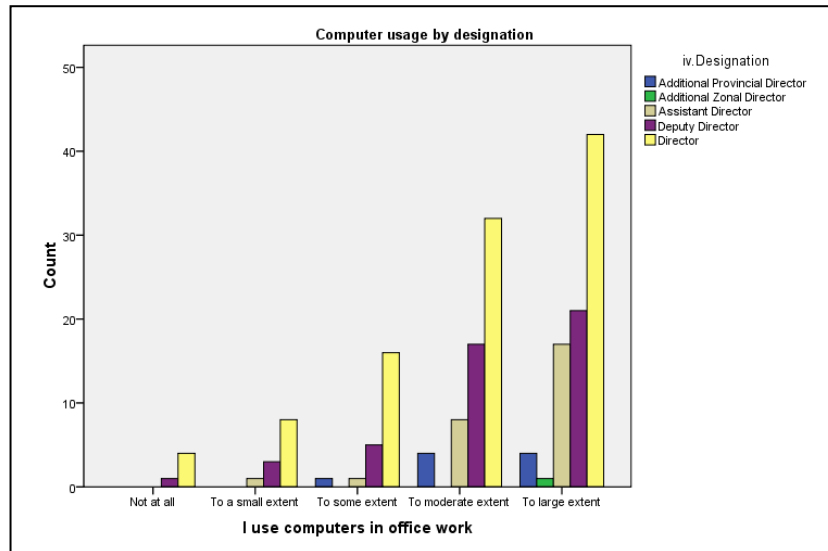
Figure 4.10.Computer usage by designation

As shown in Figure 4.10, top level managers at the Ministry of Education have a good competency level compared to their age and position and being employed at a public sector organization.

According to Abdulla (2001), for success of end-user computing, both the end-users' computer literacy and top management's computer literacy are major factors. Higher level computer literacy increases the likelihood of success of an information system implementation.

According to the survey results computer usage has shown a positive trend while most of them use computers for their office work. Among the three administrative levels of education, large extent of officers used computers for their office work.

According to results presented in Figure 4.10, officers at all levels of administration at the Ministry of Education possessed good knowledge of computers. Respondents indicated that 98% at National level, 94% at provincial level and 87% at zonal level managers have the capacity and they use computers for their day to day work.
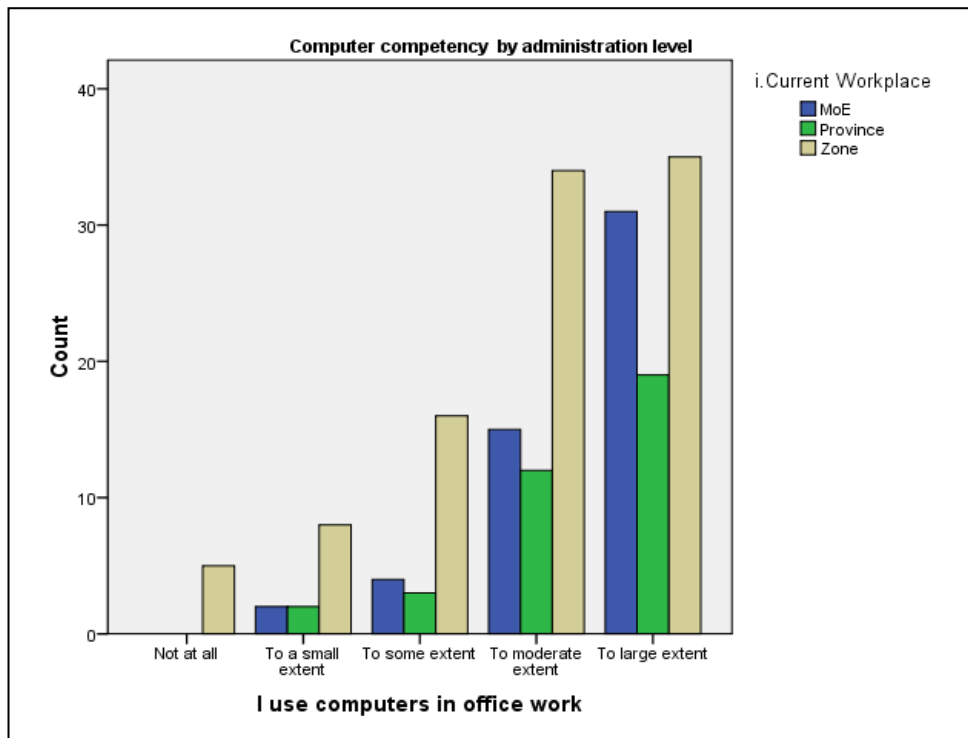
Figure 4.11. Computer competency by level

The managers' capacity of using internet and email is a determining factor for the success or failure of the information system adoption. As illustrated in Figure 4.11, 92% of the managers have the capacity to use email for their office work. The probability distribution depicted in Figure 4.11 implies a positive trend in the usage of computers for education management and communication. According to the survey results, the higher internet email usage by officers of different designations is quite significant for the IS adoption. Most of the top level managers use the internet and email for their office work.
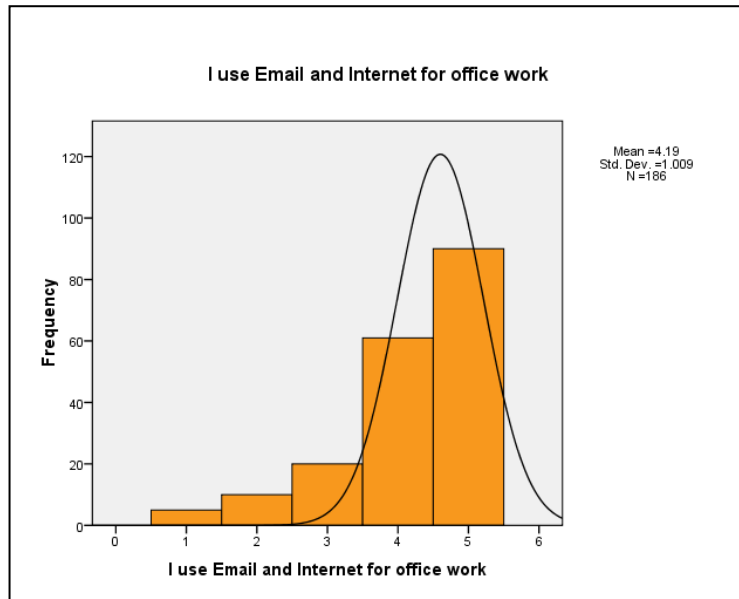
Figure 4.12: Internet and email usage

Geographical differences of the internet and email usage is presented in Figure 4.12 and 2.7% of the respondents indicated that they do not use internet and email while 5.4% use internet and email to a small extent. For a successful implementation of information system, all managers should have the capacity for effective communication and online communication facility. Top managers' online communication experience may help them to acquire new knowledge on ISM.
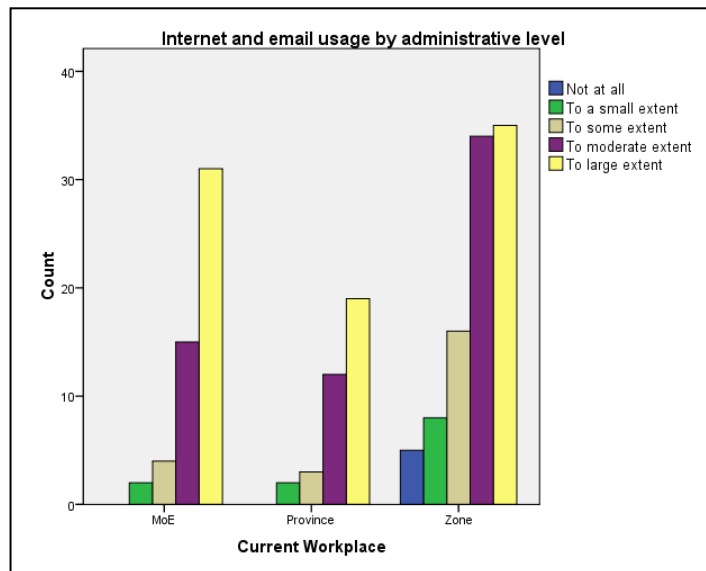
Figure 4.13.Usage of internet and email for office work

A reliable internet facility for day to day work affects the usage of the internet and email communication and access to monitoring systems. Results of this survey shows that zonal level has a major issue on internet connectivity. As presented in Figure 4.13, 21.7% of the respondents. Some small percentage have (7.7%) indicated 'Not at all' and 14% have chosen the response '*to a small extent*', indicating less reliable facility available for internet access. Only 48.4% of the respondents (14% indicating '*to a large extent*") have the facility for reliable internet.
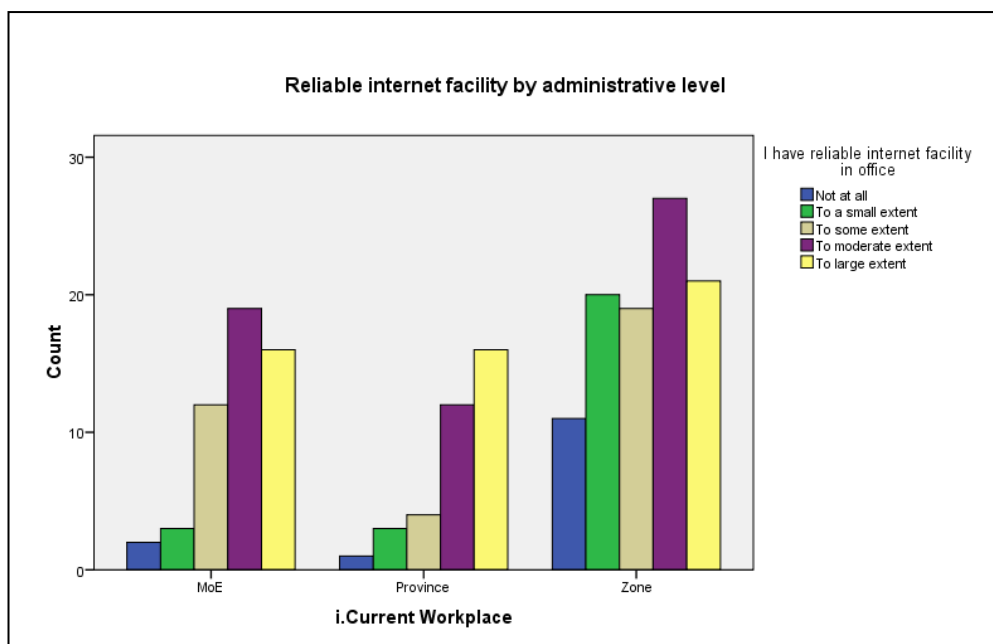
Figure 4.14: Reliable internet facility

Almost all officers use internet for their duties at the moment but the issue is with the reliability of internet access. According to the survey, reliable internet connectivity was the issue for education sector at all three levels in education administration and monitoring. According to the data table below, 59.7 % of the respondents have connectivity less than to a moderate extent. Only 28.5% of officers have reliable internet connectivity for their office work.

According to survey findings the mode of the respondent was 4 ("*To a moderate extent*") and it appears that reliability of the internet connection to all level of officers

is not up to a satisfactory level. Technological feasibility of the office environment of the education sector is moderate for MIS implementation.

Table 4.5 Distribution of reliable internet capacity

I have a reliable internet facility in office

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not at all	14	7.5	7.5	7.5
	To a small extent	26	14.0	14.0	21.5
	To some extent	35	18.8	18.8	40.3
	To a moderate extent	58	31.2	31.2	71.5
	To a large extent	53	28.5	28.5	100.0
	Total	186	100.0	100.0	

Data analysis pertaining to the capacity of the managers is important for strategic planning and monitoring. If they possess data analysis culture in the planning and monitoring context, they require data and information for insight creation. MIS requirement is generated with their usage of the data and analysis culture that the organization had followed. It appears that most of the top level managers could analyze data using excel office application and they have already established an analysis culture in office environment. According to survey results, most of them were able to analyze data using excel. Figure 4.15 shows the positive trend in the distribution of all respondents in this survey in data analysis. As presented in Figure 4.15, 6% of the managers have no competence and they do not apply for the data analysis. 32.3% of the respondents are not in acceptable level of their capacity for data management and analysis.
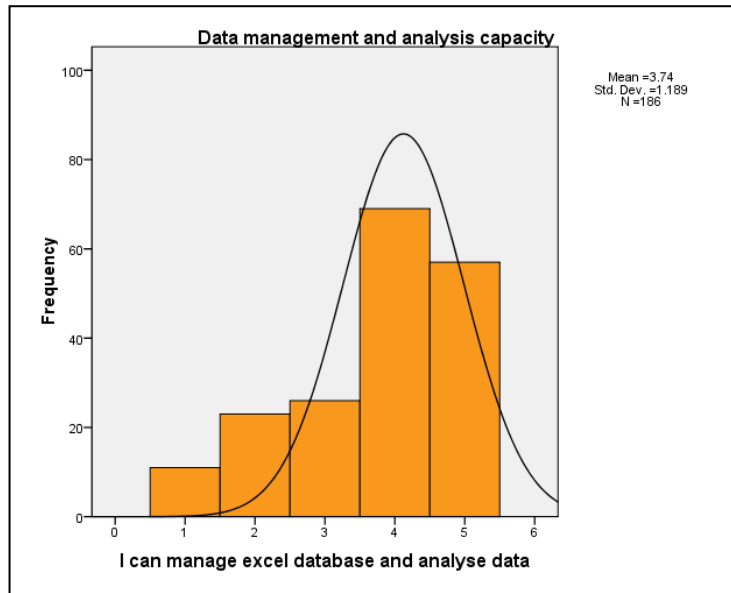
Figure 4.15. Capacity of the data management

As illustrated in Figure 4.16 given below, a majority of the managers have the ability to manage and analyze data using an application package in the computer. Deputy Directors (DD), Assistant Directors (AD) and Directors are the highlighted groups among the survey respondents in their impressive level of ability of data analysis using computers. In director and deputy director levels only 6% respondents were unable to excel data bases and analysis of data. 12% of the respondents have the capacity to a small extent for data management using excel.
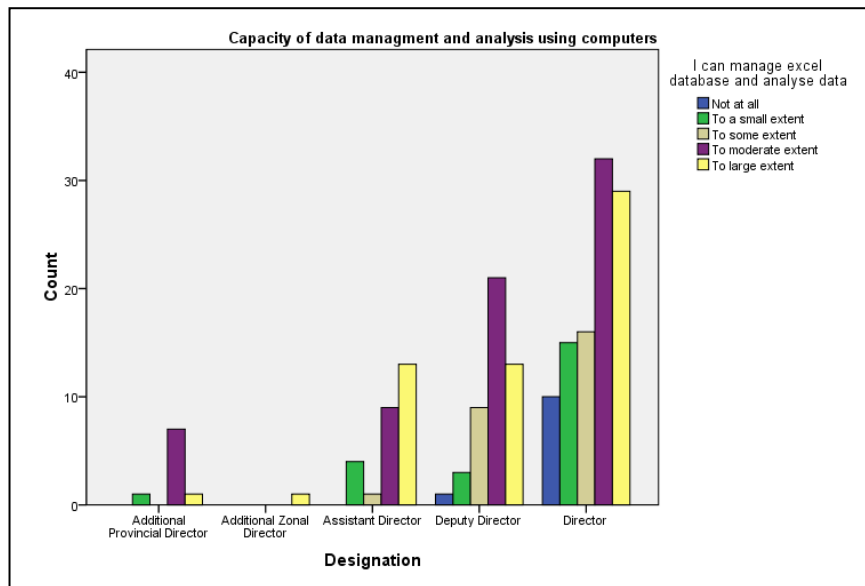
Figure 4.16.Capacity of data management and analysis by using a computers

4.4. Inferential Statistic Analysis

Inferential statistics were used to reach an extent beyond the immediate data alone. Study analysis generated inferential statistics to judge of the probability of an observed difference between groups which was a dependable one or one that might have taken place by chance in this study. This study had used descriptive statistics simply to describe what was going on in survey data. Inferential statistics generated with descriptive statistics and Pearson correlation Metrix, was carried out to test all variables and their dimensions.

4.4.1. Descriptive statistics for policy dimension

Information management policy is a key strategic document for an organization that would help align information management practices to fulfill the requirements of an information governance framework. Policy document provides scope, legislation and other key mandates, creation and maintenance of information, Systems used to maintain information, Access to information, Release of publicly available information, Retention or Destruction, Transfer of data, Roles and responsibilities, Communication and training, Monitoring and review, Resources, Senior management

endorsement (National Archives of Australia, 2018). The Ministry of the Education is a large organization which links with provincial ministries to manage the education system of the country. Education management and monitoring is a large component at the ministry and a comprehensive policy for information management is essential. This dimension will present the current requirements of information management policy and implementation environment within the organization.

The results analysis presented in Figure 4.17 indicates that the central tendency of the (information management policy) in first item under the policy dimension, a majority of the managers were to accept that information management policy which is a must for the success of MIS. As indicated in the histogram, the graph is left-skewed. It appears that the requirement of Information management policy for the Ministry of education had been accepted by 97.9% of the managers.
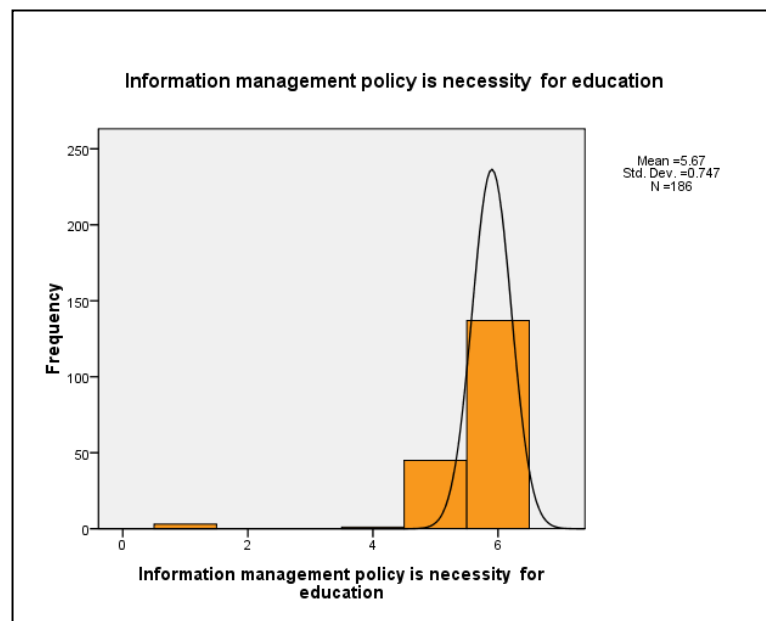
Figure 4.17: Distribution of policy requirement measures

According to descriptive statistics analysis results depicted in Table 4.6, the maximum, minimum, means and standard deviations and variance were multi items tested for policy dimension. Table 4.6 indicates that respondents have agreed to have information management policy at the Ministry. They expect that information management policy would lead to a successful MIS implementation. The necessity of

information management policy to influence the MIS implementation process is a statement supported by a mean of 5.67 and a standard deviation of 0.055. MIS requirements for ministry operations is contributed by mean of 5.64 and a standard deviation of 0.051.

Table 4.6: Descriptive Statistics for items in policy dimension

Item	N	Minimum	Maximum	Sum	Mean		Std. Deviation	Variance	Skewness	
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic	Statistic	Std. Error
Information management policy is necessity for education	186	1	6	1054	5.67	.055	.747	.559	-4.160	.178
Annual budgets are allocated for ISM	186	1	6	698	3.75	.088	1.201	1.441	-.440	.178
MIS is essential for running and managing education today	186	2	6	1049	5.64	.051	.693	.480	-2.532	.178
Systems can be developed without any donor push (ADB,WB,JICA	186	1	6	755	4.06	.109	1.486	2.207	-.482	.178
Auditors legally accept electronic files	186	1	6	680	3.66	.102	1.395	1.946	-.308	.178
Valid N (listwise)	186									

As results shown in table 4.7 indicate, all variables were selected on a six-point scale. As illustrated above, it could be seen that a higher mean is indicated for the item of "*Information management policy is a necessity for education*". A lower mean (3.66) is indicated for the legal "*Acceptance of the electronic file for auditing*". The variance for all variables is rather high, indicating that participants' answers were not always close to the mean on all variables. As indicated in the table 4.7 above, information management policy requirement for the MIS implementation success or failure, is a highly significant factor for the dimension. Top level management interviews have generated the same results.

Requirement of the management information system for the Ministry of Education has been accepted and identified as a major requirement by 94.1% of the top level managers at all levels. As presented in Figure 4.18, the analysis of central tendency of this item is left-skewed.
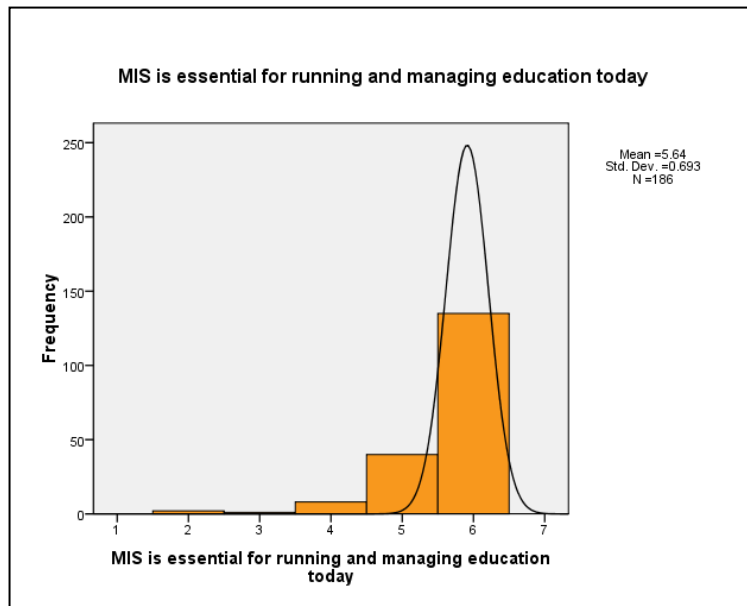
Figure 4.18. Requirement of MIS for education management

When organizations are not allocated annual funds for information system management, it affects the sustainability of IS. Results of the study indicated that 50% of the managers agreed on annual budget allocations for ISM. Figure 4.19 given below indicates that there is a normal distribution of the respondents.
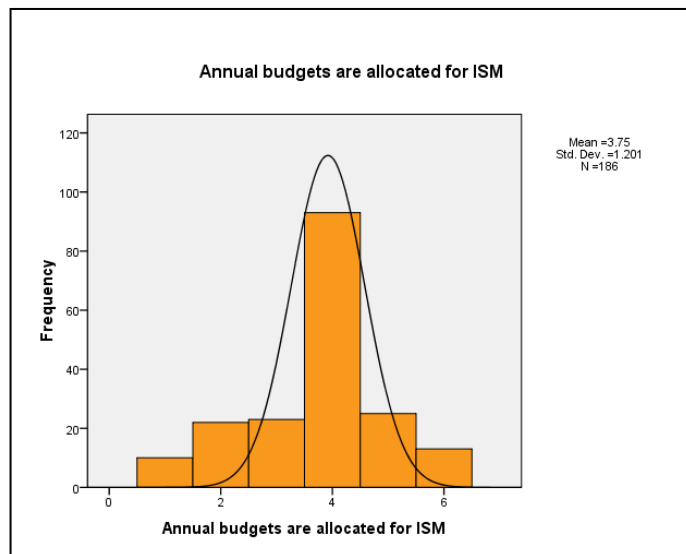
Figure 4.19. Annual budget allocation for ISM

In the current context of management, acceptance of electronic or digital reports for auditing is in a positive stage, but not at an acceptable level. The graphical representation of this result shows normal distribution. Data representation in this variable shows normal distribution while the curve is symmetrical. Mean of the item is 3.66 and less than all other variables in the policy requirement dimension.
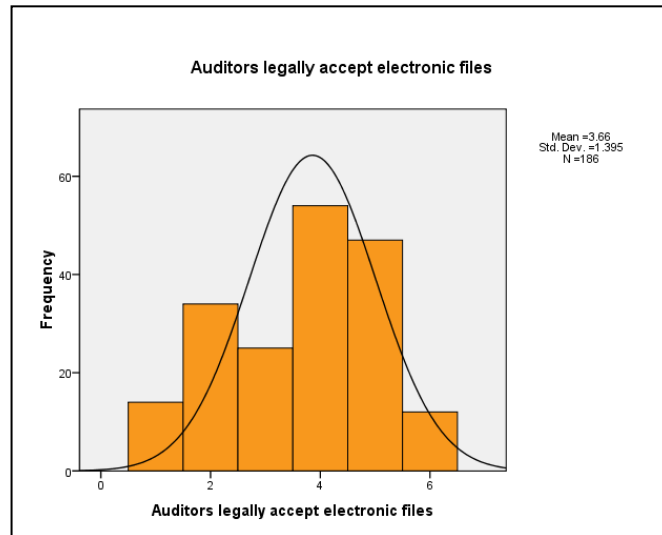
Figure 4.20.Acceptance of elcetronic document for auduting

One objective of this research study is to identify and explore the major factors that would lead to the successful adoption of MIS. According to the survey results analysis, information management policy requirement for the education sector is a major factor where attention should be paid to before a system development attempt is made. As an organization they require to develop a policy for Information management. For implementation of policy a budget should be allocated annually. The managers have the confidence that they could develop a system without donor agency support. Therefore allocation of a budget for MIS development and the implementation is a major requirement according to this study.

The Ministry of Education initiated its first EMIS project as a donor funded project. According to the analysis of the interview questionnaire results, The senior management in the planning division, while donation for the whole process had been made without prior consultation or without carrying out a needs analysis by the recipient ministry. Operational/running costs were met by the government after the

project period was over. Funding (capital and human resource requirements) ends with the project phase. The budgets for ICT were inadequate after the project is over. The lack of ICT policies and master plans to guide investment are major risks at all levels to the extent that, with a number of donors funding ICT, there had been multiple investments for the same project due to lack of coordination. A focus on ICT applications that support traditional administrative and functional transactions is necessary rather than effective information processing and distribution within and without government departments.
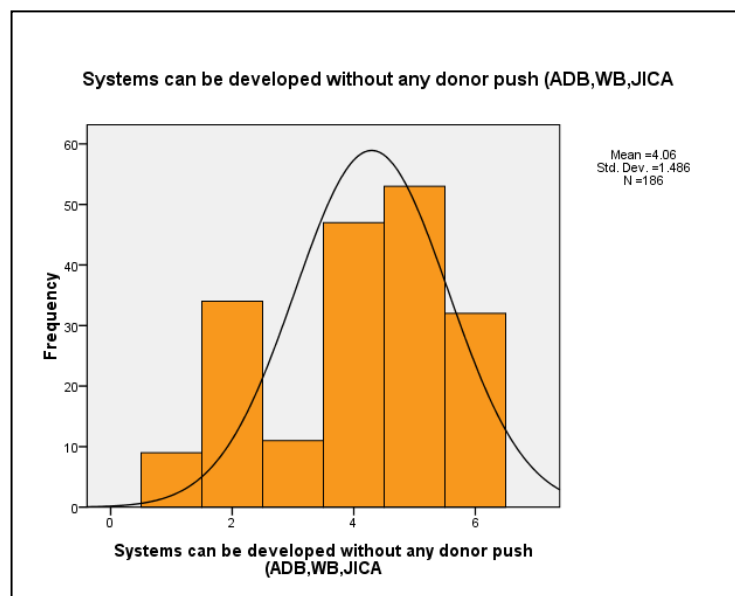
Figure 4.21. IS can be implemented without donor support

The results of the current survey revealed that 29% of the managers did not have the confidence to implement MIS without any donor funds. The ministry itself had not initiated the development and Implementation of EMIS for last the 10 years. Lack of policy for information management and ICT initiatives have become major reasons for the ministry to depend on external donor agencies. According to survey results, 70% of the managers had a positive mind set to invest on information management without obtaining help of donor agencies.

Current status of ICT policies

As per interview results from all senior managers' responses, non-availability of an Information management policy was pointed out as a major factor that affect the successful adoption of MIS. They pointed out that the requirement of an ICT master plan for education management as a timely requirement for the Ministry of Education in Sri Lanka.

Most of the managers have identified the major requirements of Policy for educational management; they are

1. Policy for digitalization of administrative work
2. Organizations comply with legal or governmental regulations
3. Operational policy for Information systems
4. Continuity of programme and project
5. ICT master plan should cover ICT for Education Management

According to the analysis of interview results, policy has become a major issue affecting the success of the MIS adoption process. As the director planning explained, an operational policy had not been developed before the implementation of MIS.

4.4.2. Descriptive statistical analysis for organization culture dimension

According to literature, organization culture leads to success or failure of information system implementation of the organization. There is much evidences that organizational culture is a critical success factor in the design, development and implementation of information systems in any organization (Indeje & Zheng, 2010).

The current study was able to find out the effects that the organization culture had on the successful adoption of MIS and also to achieve this objective, participants were asked to respond to 5 items in the questionnaire on a Likert scale of 1-6.

Its the results analysis depicted in Figure 4.21 indicate, 33% of the respondents disagreed on supportiveness of current organization culture.
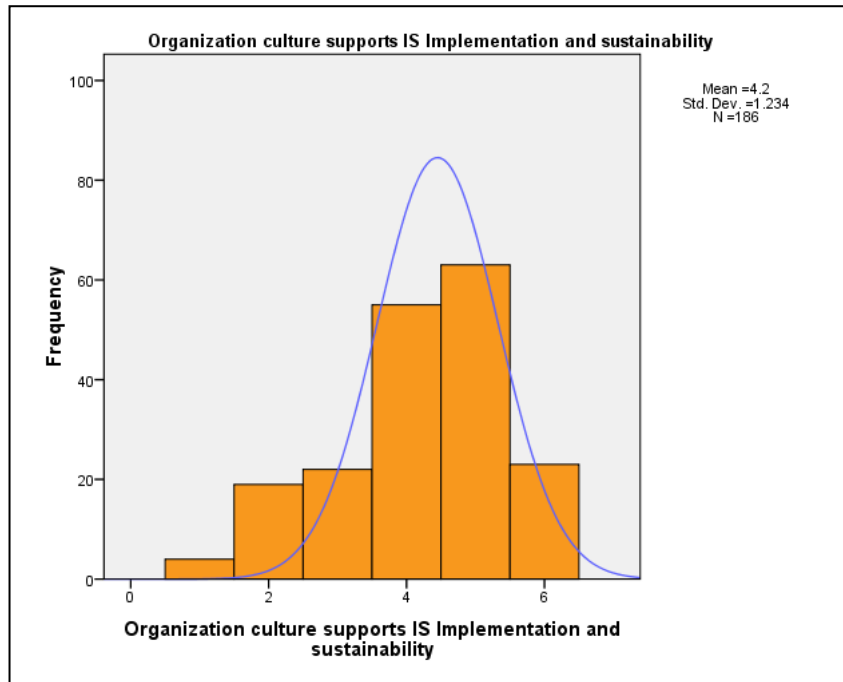
Figure 4.22: -Supportiveness organization culture for adoption of MIS

The Ministry of Education has a 80 years of history and eventually a culture had been developed with history and the working culture. This will determine in part the reactions that people have to certain behavior and will dictate ways to advance within an organization. This politics could help for the IS projects implementation and its success. This item has illustrated how organizational politics affect information system adoption.
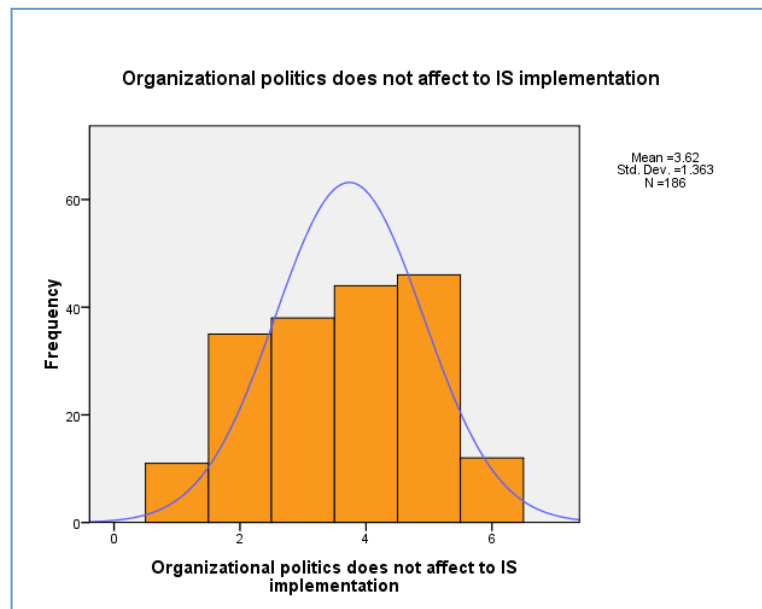
Figure 4.23. Affects of organization politics for IS

Figure 4.22 illustrates the responses measures and 59% managers have accepted that politics at the Ministry of Education could affect system implementation. This fact could be seen by the responses of the officers at all levels of the organization and the highest percentage of 51% which is in the results yielded by zonal level.

Most previous studies had recognized that organizational culture has a powerful affect on the performance and long-term effectiveness of the organizations (Masood, 2006). Masood further illustrates in his study that among others, organizational culture had a significant correlation with IS implementation success.
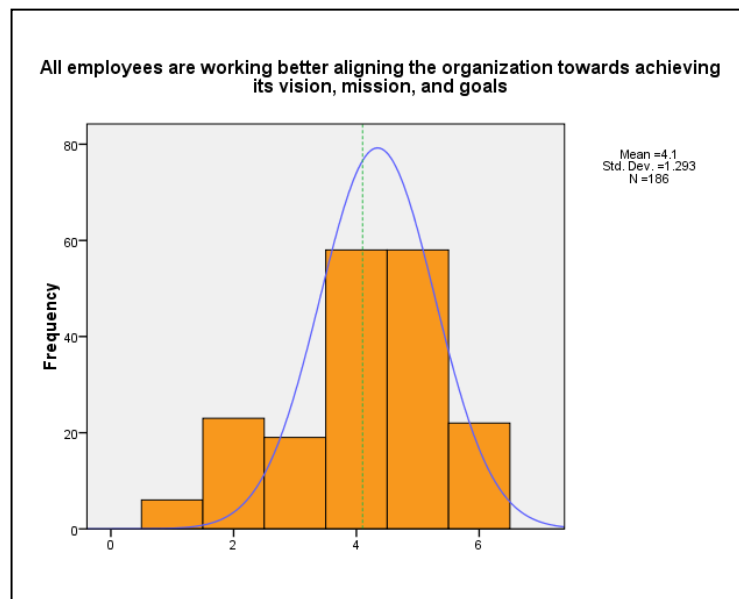
Figure 4.24.Goal achievement culture

Figure 4.23 further reveals the organizational type and its culture. Public sector organizations provides services to the public while they are not earning money. 59% of the responders have disagreed to this statement and employees are not working towards target. The success of new project implementations dependent on the employees' perception and working culture. As per results of this study, the Ministry of Education's culture has made a significant contribution for the negative effects of IS adoption.

Skills and knowledge on information systems and monitoring could be obtained by training. Public sector organization's employees are provided with many opportunities

on the above subject. Managers at top level form the decision making process, should be trained for better implementation and usage of systems. Figure 4.24 reveals that 59% of responses disagree on the method they provide foreign and local training opportunities. Which had not been provided to everyone. The distribution curve is symmetrical for 186 responses.
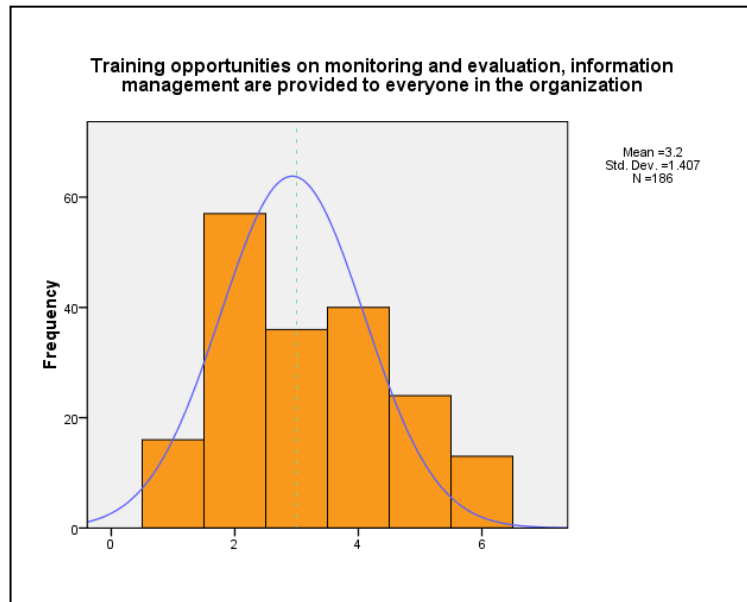
Figure 4.25. Distribution of training opportunities

4.4.3. Internal structure and management process

Questions included in the survey were designed to measure the influence of the internal structure and management process of the Ministry of Education. Five items were used to measure the internal structure and management process. Table 4.8 presents the summary of the information. For most of the items the mean was over 3.1 for the dimension of internal structure and management process.

The item of "*Current data management process is organized*" checks whether the education management process is supportive and ready for information system adoption. As per results, 38% of the responses did not agree to the statement while 62% have accepted the current management process. IS management should find ways to provide for the long-term continuity of data definitions and data aggregate

classifications, or a historical record of changes, to maintain the usefulness of historical data (Sharon &Wilpen, 2009).

New planning and budgeting procedures should be developed to reduce the impacts of short-run political priorities and the lack of political continuity that could undercut comprehensive and long-term IS planning (Sharon &Wilpen, 2009). Political influence and interest in the management process is a major factor, contributing to the success of public sector projects. This was measured by using the item "*Political factors do not negatively affect MIS Implementation,*" and 42% disagree to this statement. Common consequences of Sri Lankan political cycles is that frequent leadership and programme changes could cause discontinuities in basic data element definitions and the change the priorities at the ministry. As per the data analysis education sector appears at some significant level.

The survey measured as to whether the current management process organized had helped system implementation. This was measured by using the item of "*Strategic planning, budgeting, time-frame and scheduling are organized*" and 63% of the respondents accepted the current management process.

Decision making powers of the top management positions was measured using the item of "*Most of managerial positions have decision- making autonomy*". As illustrated in Table 4.7 the Mode of this item is "2" (Disagree). Respondents have found it as an issue in the sector that would affect the innovation and new approaches in education management. 60% of the respondents disagree to the statement. The ability of the education sector leaders and executive managers to select who should make distinct decisions in various critical and challenging situations is not up to the acceptable level. This may seriously affect the successful adoption of the information system.

Public sector managerial position changes were measured using the item of "*Frequent transfers of top managers due to elections and political appointments have not affected the IS implementation*". More frequent turnover of top managers due to elections and

political appointments, difficulties in devising incentives for individual performances and lower work satisfaction and organizational commitment, is unique to the public sector (Bozeman, 2001). As illustrated in Table 4.8, 55% of the respondents have accepted that there was an effect of frequent transfer of top level managers on MIS adoption.

Previous studies have pointed out this issue and its impact on the continuation of project programme. The main goal of most political appointees is to promote the policies of the present administration and/or change the policies of the previous administration. Few political appointees focus on organizational management issues as they had no experience and will not be in government service for a long and desire to focus on policy issues, not management issues. Political appointees receive little encouragement to focus on management issues (Mare, 2017).

Table 4.7: Descriptive Statistics for internal structure and management process items

		Current data management process is organized	Political factors do not negatively affect MIS Implementation	Strategic planning, budgeting, time-frame and scheduling are Organized-	Most of managerial positions has a decision- making autonomy	Frequent transfers of top managers due to elections and political appointments have not affected IS implementation
N	Valid	186	186	186	186	186
	Missing	0	0	0	0	0
Mean		3.68	3.75	3.67	3.12	3.26
Median		4.00	4.00	4.00	3.00	3.00
Mode		4	5	4	2	4
Std. Deviation		1.218	1.366	1.175	1.264	1.359
Variance		1.483	1.866	1.380	1.597	1.847
Sum		685	697	682	580	606
Percentiles	25	3.00	2.00	3.00	2.00	2.00
	50	4.00	4.00	4.00	3.00	3.00
	75	5.00	5.00	5.00	4.00	4.00

4.4.4. Top management supports

Top management support is the key to the recurrent factor that is critical for the effective IS implementation. It also stated that, when the top management actively participates in shaping the vision and the strategies for use of the web technologies, one of the IS technologies and their actions serve as a powerful signal to the rest of the managerial community. It also noted that task interdependencies embedded in organizational routines, pose significant challenges for its successful implementation (Sharma & Yetton 2003).

Current survey had measured the top management support using four items; *"Management is aware of the benefits that could be achieved by implementing systems", "Management always support and encourage implement and use information system", "Management provides the necessary help and resources to the implementation system", "Management always expect as a new approach, while technology implementation is allowed"* were used to measure the specific dimensions.

Table 4.8 reveals the survey results of the 186 respondents on top management support. All items are presented over 3.9 "mean" and thus the analysis indicated that there is a positive organization environment for the MIS implementation.

Managers' knowledge on benefits of IS implementation was measured using the item *"Management is aware of the benefits that could be achieved by the implementing systems"*. From 186 responses, 86% of the managers are aware of the benefits that could be achieved by implementing MIS. According to survey results, the current status of the top management support is more positive and leads to the success of MIS Adoption.

Managers should support the provision of all needs and overcome resistance and barriers in the path to success of MIS implementation. The above requirement was measured using the item of *"Management always supports and encourages the use of implement information system"*. Mean of the responses for this item was 4.9 and Mode of this responses was 5 (Agreed). It appears that managers in the education sector frequently supports and encourages the use and implementation of information systems. Summary of the results reveal that 80% of managers are in a more positive and acceptable level.

Table 4.8: Descriptive statistics top management support measures

Items	N	Range	Minimum	Maximum	Sum	Mean		Std. Deviation	Variance	Skewness	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic	Statistic	Std. Error
Management is aware of the benefits that could be achieved by the implementing systems	186	5	1	6	859	4.62	.082	1.115	1.243	-1.023	.178
Management always supports and encourages the use and implement information system	186	4	2	6	914	4.91	.068	.932	.868	-1.286	.178
Management provides necessary help and resources to implementation system	186	5	1	6	728	3.91	.085	1.155	1.333	-.278	.178
Management always expect new approach and technology implementation is allowed	186	5	1	6	786	4.23	.095	1.296	1.678	-.715	.178
Valid N (listwise)	186										

The importance of top management support has focused by many researchers. *"Management provides the necessary help and resources to implementation system"* was an important area measured in this study. 71% of the managers at all levels of administration, had accepted the above statement. Mean for this item is 4 and distribution of the responses are symmetrical. Figure 4.26 Illustrates management support by providing the necessary resources on system implementation.
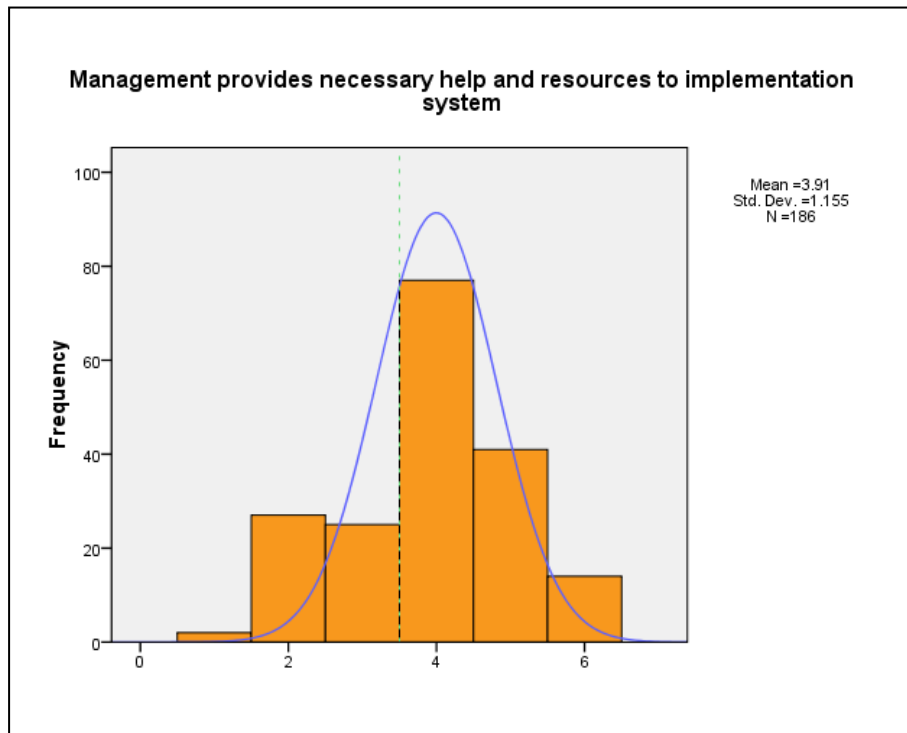
Figure 4.26.Distribution of responses

Executives with relevant knowledge and skills on IT, tend to be more productive, more proactive, become more involved in IT projects and hold more favorable views on IT. Senior management experience and IT knowledge in information management technology lead to the success of new technology implementation projects (Broadbend, 2001). This area was measured using the item *"Management always expect a new approach while technology implementation is allowed" along* with six Likert scale measurements. The current survey reveals, 78% of the managers always expect new technology implementation in education.

Table 4.10 presents a partial correlation between the management's IT knowledge and new technology implementation support. Management always expects new approaches and technology implementation highly correlated with all three IT literacy measures. Current research was tested whether there is a statistically significant linear relationship between

management support on new approaches and technology implementation and their IT knowledge and skills.

Table 4.9; Correlation between top managers' IT literacy and management support on new approach

Control Variables			I use computers in office work	I use Email and Internet for office work	I can manage excel database and analyses data
Management always expect new approach and technology implementation is allowed	I use computers in office work	Correlation	1.000	.784	.699
		Significance (1-tailed)	.	.000	.000
		Df	0	183	183
	I use Email and Internet for office work	Correlation	.784	1.000	.628
		Significance (1-tailed)	.000	.	.000
		Df	183	0	183
	I can manage excel database and analyze data	Correlation	.699	.628	1.000
		Significance (1-tailed)	.000	.000	.
		Df	183	183	0

As Table 4.9 illustrates, there is a positive correlation between IT knowledge and skills of top level managers and new technology implementation approaches.

4.4.5. Analysis for work environmental factors

According to Kathryn (2004), public sector work environment could be explained as a less market exposure resulting in less incentive for productivity and effectiveness, lower allocation efficiency, more legal and formal constraints and higher political influences, including impacts of interest groups and need for support of constituencies. Work environment factor was measured using seven (7) items in this dimension.

Managers were asked to measure the work environment, partnership, planning process, team work, shared culture, decision making power and employee development. Table A1, in Appendix A, is presented with descriptive statistics for work environmental factors. Except

for the training provided to improve monitoring and information management, all other six items have yielded a positive result. 75% of the managers indicate that they are working to achieve the target. 31% respondents are unable to get the external support to develop information systems. As per Table A.1 in Appendix A, education sector Planning processes are organized and done based on a feasibility study and analysis of data from various sources. Officer's responsibility for monitoring and evaluation has been identified by 85% of managers in the education sector. Sharing information with other branches is common practice for 85% of managers. These factors leads to develop online system development, implementation and sharing information within the organization. Most of the managers have power to introduce new systems for their organization. 66% of the managers have authority to introduce technology, systems without prior permission of their senior managers.

According to Mare (2017), there is very little personal gain in the government for taking risks on policy or programme and being successful in achieving the goals more effectively. However, there was potential for substantial criticism and other personal loss if the innovative attempts fail.

The most critical factor highlighted in current survey was skills and capacity development programme on MIS, monitoring systems, information systems for managers at the Ministry of Education. As illustrated in Table A1 in Appendix A, 80% of the managers had not been trained (Foreign/Local)) on MIS, monitoring systems and information systems.
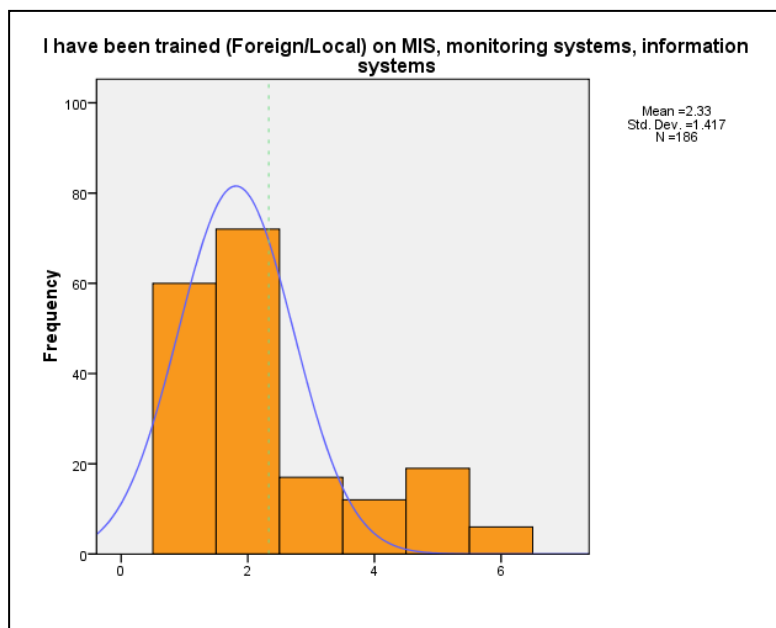
Figure 4.27.Distribution of training opportunities obtained for MIS, M&E, IS

4.4.6. Analysis of people characteristics

In people dimension, two variables were used and they are computer self-efficacy, and user characteristics. A manager's previous experience, perception, roles and responsibility, accountability, values and bad experiences were major areas measured in this dimension. The public service and government compensation rules makes it more difficult to encourage outstanding performance and discourage poor performances. This domain has a less market driven competition and is always a legislated domination.

People characteristics dimension used eight (8) items to measure 186 responses accompanied by a 6 point Likert scale. As illustrated in Table A.10 in Appendix A, only 53% of managers have prior experience in using the various types of IS. Managerial IT experience and awareness of IS, IT application will lead recognition towards their IS potential and ability to plan strategically. Managers in the education sector have limited opportunities to change the sector and get the experience from the private sector and other ministries. SLEAS is a unique service to the Ministry of Education while opportunities at other organizations are minimum.

The managers' confidence in IS application was measured via the item "*Information System are easy to be developed and implemented for education*". 26% of the respondents had a negative attitude towards MIS application in the. Most of the respondents asserted that managerial IT knowledge and previous experience directly and positively affected the success and extent of IT in an organization.

The manager's responsibility on MIS was measured using the item of "*TOR/Job description has been defined for a manager role in ISM*". 50% of the managers had not agreed to this statement while only 23% of managers have both strongly agreed and agreed to this statement. As per Table A.10 in Appendix A, Mode of the responses is "4" (Slightly Agree). According to Mare (2017), in most outstanding private sector organizations, there are clear, well understood, job-by-job, top-to-bottom goals and objectives. In government, goals and objectives have been ill-formed, uncertain and soft.

If managers are confident about their current manual process they may not wish to promote online systems. In order to measure the confidence level of the current data management process, the item "*Current manual process is more reliable*" was used. 62% of responses

are in the agreed group while 38 % are in the disagreed group. Distribution of responses is normal.

Manager's accountability for data management was measured using item *"I am accountable for data collection, data processing and system implementation"*. 82% managers are aware that they are responsible to collect, analyze and implement the system. This factor is feasible for system culture and successful adoption of the new system.

Managers' perception on value of system implementation was measured using the item of "*Investment on IS implementation is useful for education*". 89% of managers knew the value and benefits of system implementation.

Teamwork and shared culture is not a common factor for the government sector organization due to structure and model of operation. Information sharing mechanism is essential before system development in an organization. The item of "*I would like to share my information with others*" was used to measure the current survey. 93.5% responses have agreed to share their information with other branches.

Managers' bad experiences on system implementation was measured using item *"I have many bad experiences in Computer based system in education. Therefore I cannot trust IS*". Manager's previous experiences affect current project's success and decision making on new developments. The ministry of Education has a few similar experiences and therefore the reliability on new systems was not at the acceptable level. As illustrated in summary table, 43% of the respondents agreed on the statement which is a considerable number when implementing a new system and building reliability among top managers is essential.

Manager's involvement in system development and implementation was measured using the item "*I have limited responsibility to involve in IS development process*". "Top management's direct participation in information system activities and also ensure their cooperation support contribute to overall success of IS project "(Amstrong , 2001).

Assessment of senior management responsibilities for MIS development and Implementation

As per interview data analysis, managers have identified their responsibility for development, implementation and sustainability of management information system in education. There were major responsibilities derived from the senior management data analysis. Participate in policy development process and monitoring of the system functionality, providing required resources were major responsibilities of the senior management which were the major responsibilities identified from the current study.

4.4.7. Status of existing management information systems

Evaluation of existing information systems has an added advantage in information systems management and help to create a success story for future implementation. Current survey assessed the existing Education Management System (EMIS) at all levels in operation. According to a summary of respondents, 97% of the managers accept the non-functionality of EMIS. Furthermore, the results reveal that many efforts were made to activate EMIS. Success of the system implementation was technically assessed by using three items in technological dimensions. In technological dimension, three variables were used; system quality, information quality and service quality.

4.4.8. Assessment of Existing System functionality

Assessments have been made for the existing education management system using two items. First one was about functionality and second one was about the effort made for the implementation. As illustrated in Table 4.11, 97% of the respondents were agreed on the non-functionality of the current system that is implemented for education management.

Table 4.10 Functionality of the National Education Management System

NEMIS is not working at the moment

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	5	2.7	2.7	2.7
	Yes	181	97.3	97.3	100.0
	Total	186	100.0	100.0	

According to the interview sample data analysis, there were few Information systems introduced by the senior management for the last 2 years.

1. Education Programme Management System (EPMIS)
2. Public Relationship Information Management System (PRMS)
3. Education Information Management System (EMIS)

Figure 4.27 presents the current usage level of information systems introduced by various units. As per results illustrated, accounting system is working at the moment. The other three systems are not generating outputs to the managers at the level of decision making.
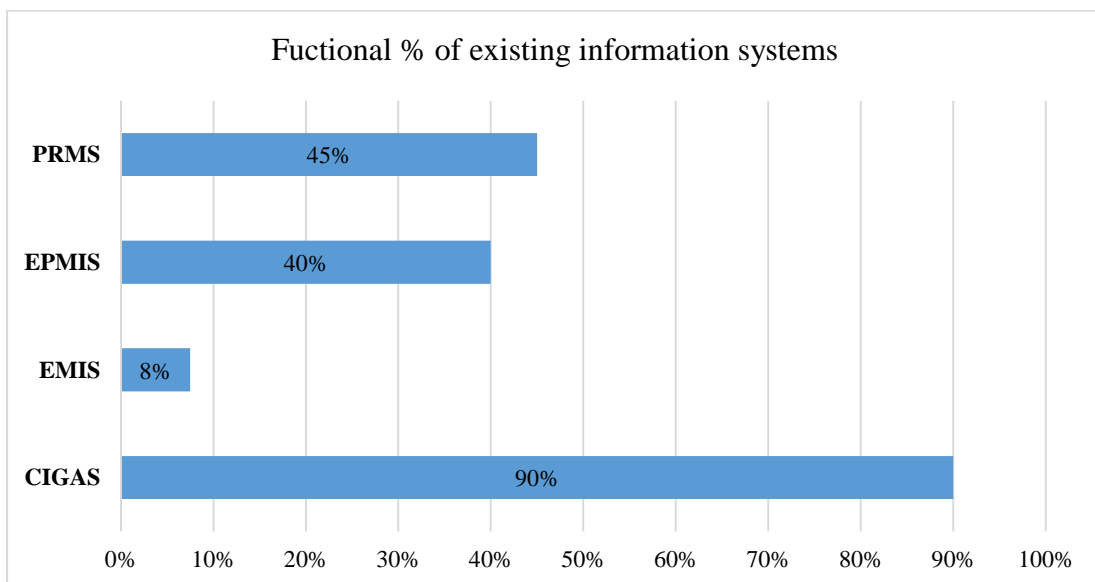
Figure 4.28. Functionality of existing MIS

4.4.9. Assessment Existing Information System quality

According to Petter (2003), information quality is the desirable characteristic of the system output. Further researcher tested relevance, understandability, accuracy, conciseness, completeness, understandability, currency, timeliness and usability in his study. According to Figure 4.15, most of the managers had not agreed to the statement on easy to use factor. 62% managers did not agree as per results illustrated in Figure 4.28. Mode of the item is 2 (Disagree) for 186 responses. All the three items used to measure system quality mode is 2 and mean is approximately 3.

As per the survey results, 58% managers have not agreed to the statement of "easy to learn". System acceptance is dependent on these basic factors and most of the implementations may fail due to quality of the MIS. As per the interview results analysis of current survey, if MIS is easy to operate and therefore, the design of the MIS has such features which makes up a user-friendly design.

As per the results of the current survey, 65% of the respondents have indicated the loss of reliability of the EMIS. Efforts made for the implementation of EMIS have failed several times. Any MIS can fail if it fails to meet certain critical and key factors of its users such as a response to the query on the database, an inability to get the processing done in a particular manner, lack of user-friendly system and the dependence on the system personnel.
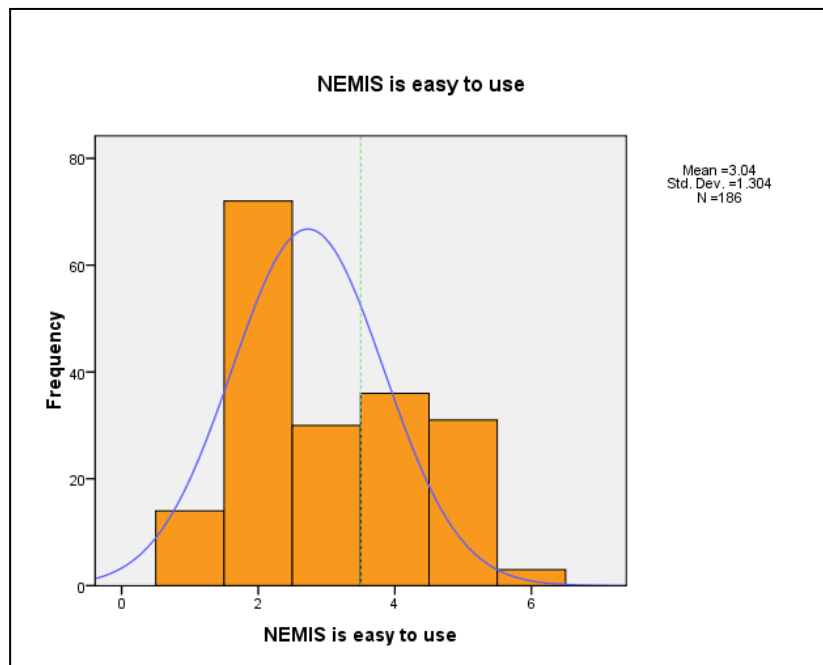
Figure 4.29. Assessment of system quality

4.4.10. Assessment Information quality

If MIS does not provide timely information which is needed by the managers, it leads to problems in the successful implementation and sustainability. Figure 4.30 provides a graphic representation of the frequency of the responses, indicating the disagreed level. As per the current survey results, EMIS has failed to provide relevant information to the top management. 73% of the responses were in disagreement level and 75% responses had not accepted the accuracy of information. 71% of the managers felt that they were not provided

with the required information for their management. 75% of the respondents have not agreed to the accuracy and reliability of the information provided by EMIS.

Disagreed responses by quality of information -Cumulative %

	Strongly Disagree	Disagree	Slightly disagree
NEMIS provides timely information	12.9	55.9	75.8
NEMIS information useful for decision making	9.7	51.6	70.4
Information in NEMIS is accurate and reliable	7.5	47.3	75.3
NEMIS provides relevant information	8.1	46.2	73.1
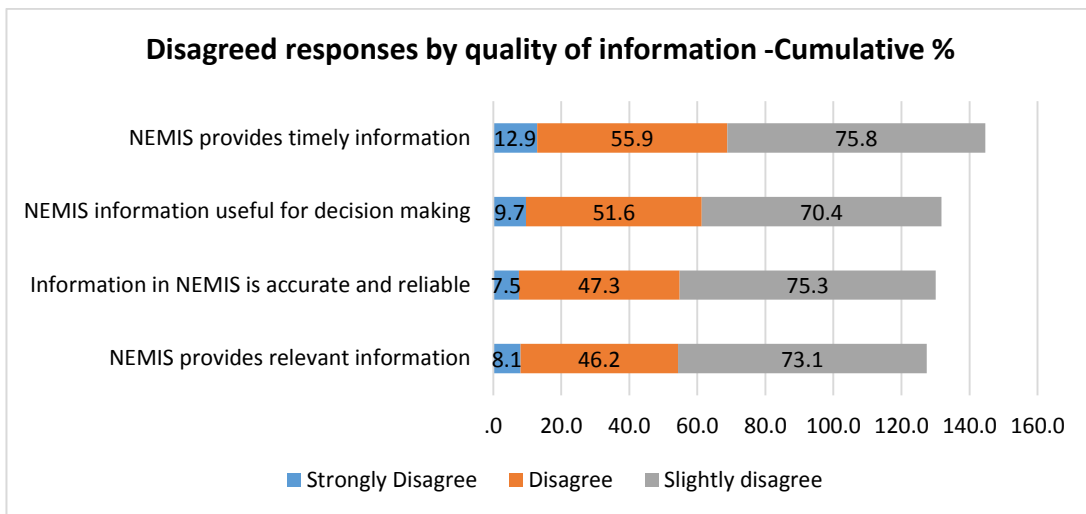
Figure 4.30. Assessment of information quality

From frequencies obtained for the EMIS technical team service quality items, it was found that 66% of the respondents were not satisfied with service provided by them. About 52% are satisfied with their knowledge. About 62% are not satisfied with their relationship they maintain with users. About 67% respondents have not accepted their feedback mechanism during the implementation period. About 59% respondents were not satisfied with the training provided for the users.

Cumulative Percent

	Strongly Disagree	Disagree	Slightly disagree	Slightly agree	Agree
NEMIS technical team provided prompt service to user		46.2	69.4	88.7	99.5
Satisfied with NEMIS technical team knowledge		30.1	47.8	75.3	97.3
Training provided by NEMIS Technical team is good and sufficient		58.6	72.6	90.9	98.4
NEMIS Technical team Feedback mechanism is acceptable		50.5	67.2	90.3	99.5
NEMIS technical team has good relationship with user		43.0	62.4	87.6	98.9

Figure 4.31. Assessment of service quality

98

4.4.11. e-Readiness

An electronic readiness is essential for adopting new technology which creates or re-engineer education management processes to gain competitive advantages. IT investment can return the benefits to the organization within a very short period of time. In the study report of "*Construction Executive thinking towards IT investment for continuous improvement and sustained competitive advantage*" the findings indicate that the main inhibitor to IT investments was the lack of know-how or mechanisms which can guide managers to successfully absorb new technologies into their work practices towards achieving competitive advantage (Construct IT, 2008).

The current study assessed e-Readiness which is the ministry's ability to take advantage of the ICTs as a facility to enhance and improve its administrative functions. E-Readiness has several components, including telecommunications infrastructure, human resources, and legal and policy framework and other resources.

Electronic readiness is measured using four items. Results of the survey shows readiness of technical infrastructure (48%), Human infrastructure (54%), Data administration infrastructure (55%) as an area to be developed for successful adoption of MIS. As shown in Table 4.11, all other four items in this dimension except technical infrastructure, show negative Skewness.

Table 4.11 Descriptive statistics summary of e-readiness dimension

		Data administration infrastructure is ready	Human infrastructure is in place for IS management	Technological infrastructure has been established (network, connectivity, etc.)	Email communication and Internet usage is common for day today work	Information requirement for organization has been identified for EMIS
N	Valid	186	186	186	186	186
	Missing	0	0	0	0	0
Mean		3.45	3.53	3.40	4.13	4.18
Median		4.00	4.00	3.00	4.00	5.00
Mode		4	4	4	5	5
Std. Deviation		1.265	1.278	1.205	1.260	1.307
Variance		1.600	1.634	1.453	1.587	1.707
Skewness		-.109	-.198	.099	-.437	-.697
Std. Error of Skewness		.178	.178	.178	.178	.178
Range		5	5	5	5	5
Minimum		1	1	1	1	1
Maximum		6	6	6	6	6
Sum		642	657	633	769	778
Percentiles	25	2.00	3.00	2.00	3.00	3.00
	50	4.00	4.00	3.00	4.00	5.00
	75	4.00	5.00	4.00	5.00	5.00

4.5. Correlation Analysis

Pearson correlation matrix was used to test inter dimension correlation. Inter dimensions were tested for each dimension in respective variable.

4.5.1. Inter-dimension correlation for organization variable

Information management policy, organization culture, top management support, internal structure and management process and work environment major dimension check the internal correlation for organization variable. All dimensions are positively correlated to each other within a respective variable. The results are shown in Table 4.13, and all variable correlation is significant at the 0.01 level. Top management support is highly correlated with other dimensions and the factor is highly significant.

Results analysis indicated that current policy for information management is a significant factor for the MIS adoption.

Table 4.12. Inter-dimension correlation for organization variable

Correlations

		Policy	Organization culture	Management process	Top management supports	Work environmental
Policy	Pearson Correlation	1	.330**	.326**	.410**	.364**
	Sig. (2-tailed)		.000	.000	.000	.000
	N	186	186	186	186	186
Organization culture	Pearson Correlation	.330**	1	**.585****	**.536****	**.615****
	Sig. (2-tailed)	.000		.000	.000	.000
	N	186	186	186	186	186
Management process	Pearson Correlation	.326**	.585**	1	**.577****	**.494****
	Sig. (2-tailed)	.000	.000		.000	.000
	N	186	186	186	186	186
Top management supports	Pearson Correlation	.410**	.536**	.577**	1	**.613****
	Sig. (2-tailed)	.000	.000	.000		.000
	N	186	186	186	186	186
Work environmental	Pearson Correlation	.364**	**.615****	.494**	**.613****	1
	Sig. (2-tailed)	.000	.000	.000	.000	
	N	186	186	186	186	186

**. Correlation is significant at the 0.01 level (2-tailed).

4.5.2. Inter-dimension correlation for technology

Technology variable was considered in four dimensions and they are e-Readiness, existing system quality, information quality and service quality.

The Pearson correlation matrix obtained for four factors is shown in Table 4.4. The results show that all dimensions are significant and positively correlated with each other within a respective variable.

Table 4.13. Inter-dimension correlation for technology variable

Correlations

		e-Readiness	System quality	Information quality	Service quality
e-Readiness	Pearson Correlation	1	.338**	.248**	.403**
	Sig. (2-tailed)		.000	.001	.000
	Sum of Squares and Cross-products	188.189	71.784	50.982	75.969
	Covariance	1.017	.388	.276	.411
	N	186	186	186	186
System Quality	Pearson Correlation	.338**	1	.811**	.674**
	Sig. (2-tailed)	.000		.000	.000
	Sum of Squares and Cross-products	71.784	240.148	188.810	143.591
	Covariance	.388	1.298	1.021	.776
	N	186	186	186	186
Information Quality	Pearson Correlation	.248**	.811**	1	.644**
	Sig. (2-tailed)	.001	.000		.000
	Sum of Squares and Cross-products	50.982	188.810	225.440	132.757
	Covariance	.276	1.021	1.219	.718
	N	186	186	186	186
Service Quality	Pearson Correlation	.403**	.674**	.644**	1
	Sig. (2-tailed)	.000	.000	.000	
	Sum of Squares and Cross-products	75.969	143.591	132.757	188.768
	Covariance	.411	.776	.718	1.020
	N	186	186	186	186

**. Correlation is significant at the 0.01 level (2-tailed).

4.5.3. Inter dimension correlation for organization policy and e-Readiness

Lack of standard ICT policies for an organization is a major issue for digitalization. Hence e-Readiness totally depends on the ICT policy which is composed of ICT infrastructure, ICT hardware, software & information system and people. ICT strategies and ICT plans should be evaluated to align with organization visions and missions in order to achieve effective use of ICT in their businesses. The Pearson correlation matrix obtained for the two dimensions is shown in Table 4.14.

As illustrated in Table 4.14, e-Readiness and Organization policy are significantly and positively correlated.

Table 4.14: Inter-dimension correlation for e-Readiness and organization policy

Correlations

		e-Readiness	Organization Policy
e-Readiness	Pearson Correlation	1	.262[**]
	Sig. (2-tailed)		.000
	Sum of Squares and Cross-products	188.189	31.503
	Covariance	1.017	.170
	N	186	186
Organization Policy	Pearson Correlation	.262[**]	1
	Sig. (2-tailed)	.000	
	Sum of Squares and Cross-products	31.503	77.061
	Covariance	.170	.417
	N	186	186

**. Correlation is significant at the 0.01 level (2-tailed).

4.5.3. Inter dimension correlation for organization policy and management support

Information Management Policy affects the functional operation of an organization such as budgeting, personnel and general management. Top level management support is dependent on policy and guidelines directed by all managers in an organization. This study has tested correlation for organization policy and management support for IS adoption.

As illustrated in Table 4.15, organization policy and management support are positively correlated.

Table 4.15. Inter-dimension correlation for Information Management Policy and Top Management Support

Correlations

		Information Management Policy	Top Management Support
Information Management Policy	Pearson Correlation	1	.410**
	Sig. (2-tailed)		.000
	Sum of Squares and Cross-products	77.061	42.911
	Covariance	.417	.232
	N	186	186
Top Management Support	Pearson Correlation	.410**	1
	Sig. (2-tailed)	.000	
	Sum of Squares and Cross-products	42.911	142.187
	Covariance	.232	.769
	N	186	186

**. Correlation is significant at the 0.01 level (2-tailed).

4.6. Inter-Variable correlation

Organization, People and Technology are major independent variables considered in this study attempting to find a relationship for the successful adoption of MIS. Among the three variables technological variable is significant at the 0.01 level.

Table 4.16: Independent variable correlation

Correlations

		Organization	Technology	People
Organization	Pearson Correlation	1	.417**	.102
	Sig. (2-tailed)		.000	.168
	N	186	186	186
Technology	Pearson Correlation	.417**	1	.232**
	Sig. (2-tailed)	.000		.001
	N	186	186	186
[People	Pearson Correlation	.102	.232**	1
	Sig. (2-tailed)	.168	.001	
	N	186	186	186

**. Correlation is significant at the 0.01 level (2-tailed).

4.7. Testing hypothesis

The one sample t-test statistical technique was used to determine whether a sample of observations could have been generated by a process with a variable mean. The purpose of the one sample t-test was to determine whether the null hypothesis should be rejected, given the 186 responses data collected from survey.

The one-sample t-test was used to determine whether a sample comes from a population with a specific mean. The one sample t-Test is commonly used to test the statistical difference between a sample mean and a known or hypothesized value of the mean in the population. (Kent State University).

4.7.1. Testing appropriateness of data for t-test

The hypothesis suitability of the data had been tested to fulfill such assumption. Study has selected the few assumptions given below and tested as to whether the 186 responses collected from the survey are meeting these assumptions before the t-Test;

1. Test variables are independent from one to another
2. Normal distribution of the population on the test variable- For the one-sample t-test only requiring approximately normal data because it is quite "robust" to violations of normality, meaning that the assumption could be a little violated and still provide valid results
3. Variable should not contain any outliers.

Technology Variable

Normality assumption was tested by the way of visually and presented in histogram. Distribution of the 186 responses for the data for the technology variable is shown in Figure 4.18.billow. The data in this survey in Figure 4.32 given below is approximately normally distributed.
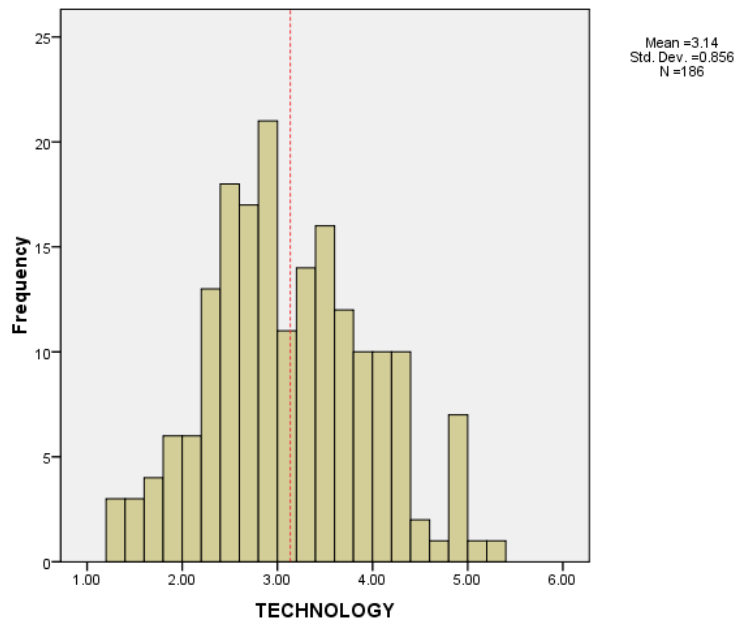
Figure 4.32: Normality distribution of respondents for technology variable

Check the outliers for technology variable

A boxplot was generated for summarizing a set of data for technology variable and following Figure 4.19 reveals the shape of the distribution, its central value, and variability. This graph was produced and consists of the most extreme values in the data set (maximum and minimum values), the lower and upper quartiles, and the median.
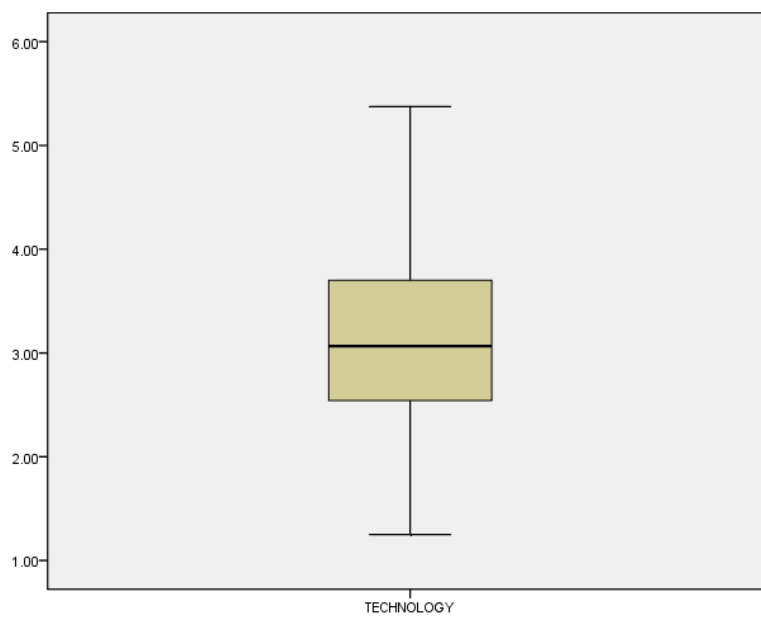
Figure 4.33. Distribution of outliers

Organization Variable

Assumption of normality was tested visually with histogram for the second variable. Distribution of the 186 responses, data for organization variable are shown in Figure 4.20 bellow. The data in this survey as depicted in Figure 4.34 below is approximately normally distributed.
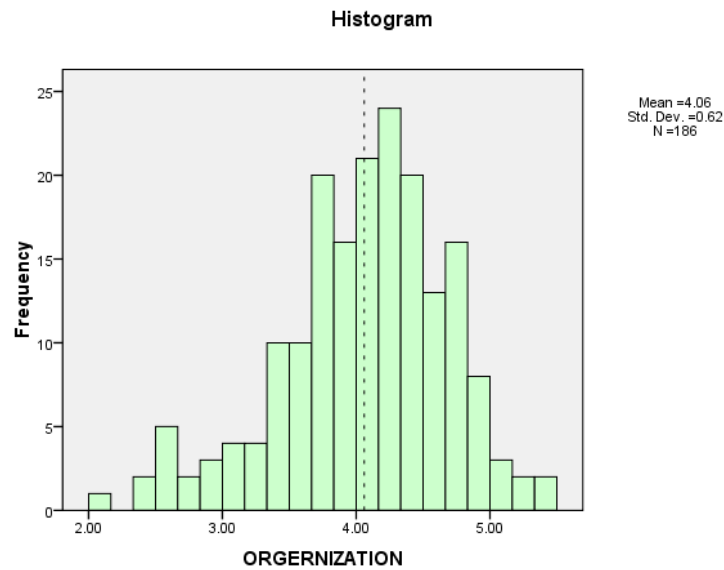
Figure 4. 34 Normality distribution of organization variable

Checking the outliers of organization variable data

Box plot is presented with overall patterns of 186 responses for organization variable. Figure 4.35 below visualizes the range and other characteristics of responses for a large group. In this variable, outliers for 186 data values are not identified and values are normally associated.
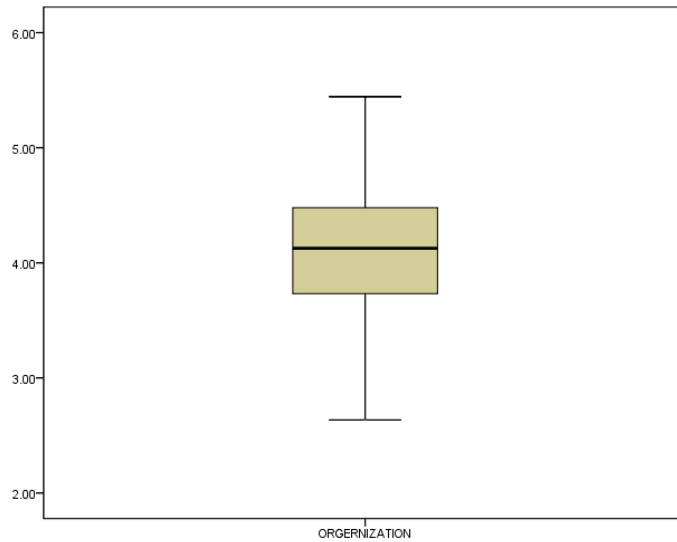
Figure 4.35. Distribution of outliers of organization variable

People variable

Assumption of normality was tested using visually with histogram for the second variable. Distribution of the 186 responses data for organization variable is shown in Figure 4.36 below. An approximately normal distribution is indicated by the data in this survey as depicted in Figure 4.22.
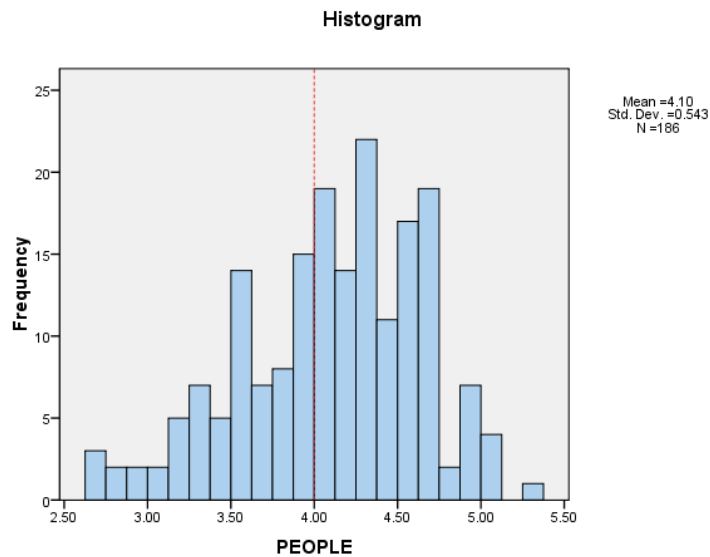
Figure 4.36: Normality distribution of people variable

Check the outliers

Box plot is presented overall with patterns of response for a 186 responses. Figure 4.37 given below visualizes the range and other characteristics of responses for a large 186 group. In this variable, outliers for 186 data values were not identified and values are normally associated.
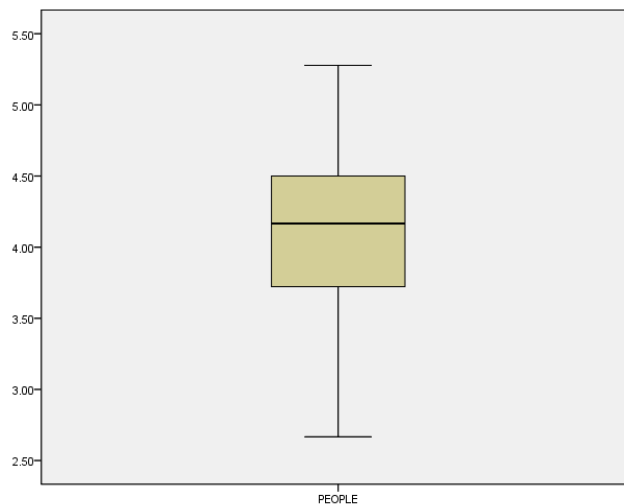
Figure 4.37 Distribution of outliers of organization variable

As a parametric procedure (a procedure which estimates unknown parameters), the one sample t-test has made several assumptions. It helps good practices to evaluate the degree of deviation from these assumptions in order to assess quality of the results. According to the results analysis; the one sample t-test for this survey data was used for three main assumptions and all are satisfied assumptions. Hence, application of the t-Test for hypothesis testing of this study is acceptable.

Testing Hypotheses 1-(Technology Variable)

One sample t-tests was used to determine if the mean of a sample is different from a particular value. This study hypothesis is one tailed and there is no option to specify a one-tailed test. Due to this being a one-tailed test, a table of critical t values was looked at in order to determine the observed t. The critical t with 185 degrees of freedom, $\alpha = .05$ and one-tailed is 1.65313186

Table 4.17 : One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
Technology	186	3.1353	.85628	.06279

One-Sample Test

	Test Value = 3					
					95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
Technology	2.154	185	.033	.13526	.0114	.2591

An attempt was made to determine if the rejected the null hypothesis could be rejected or not.

H1: There is a relationship between Technological factors and Successful adoption of MIS

H0: There is no relationship between Technological factors and Successful adoption of MIS

The decision states that if the one-tailed critical t value is less than the observed t AND the means are in the right order, then H0 can be rejected. In this example, the critical t is 1.653 (from the table of critical t values) and the observed t is 2.154, so H0 can be rejected.

A t test was able to reveal a statistically reliable difference between the mean of organization factors that have a value of (M = 3.14, s = 0.86) and 1, t (185) = 2.154, p < .05, α = .05.

Testing Hypotheses 2 (Organization variable)

The critical t with 185 degrees of freedom, α = .05 and one-tailed is 1.65313186

Table 4.18. One-Sample Statistics

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
Organization	186	4.0602	.61957	.04543

One-Sample Test

| | Test Value = 4 | | | | 95% Confidence Interval of the Difference | |
	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
Organization	1.324	185	.187	.06016	-.0295	.1498

An attempt was made to determine if reject null hypothesis could be rejected or not.

H1: There is a relationship between organization factors and Successful adoption of MIS
H0: There is no relationship between organization factors and Successful adoption of MIS

The decision rule states that if the one-tailed critical t value is less than the observed t AND the means are in the right order, then H0 can be rejected. According to this example, the critical t is 1.653 (from the table of critical t values) and the observed t is 1.324, H0 cannot be rejected.

A t test failed to reveal a statistically reliable difference between the mean of organization factor that has a value of (M = 4.06, s = 0.62) and 1, t(185) = 1.324, p < .05, α = .05.

Table 4.19. One-Sample Statistics

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
People	186	4.0998	.54255	.03978

One-Sample Test

| | Test Value = 4 | | | | 95% Confidence Interval of the Difference | |
	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
People	2.508	185	.013	.09976	.0213	.1782

An attempt was made to determine if the reject the null hypothesis could be rejected or not.

Hypotheses 3

H1: There is a relationship between People factors and Successful adoption of MIS

H0: There is no relationship between People factors and Successful adoption of MIS

According to the decision rule, if the one-tailed critical t value is less than the observed t AND the means are in the right order, then H0 can be rejected. In this example, the critical t is 1.653 (from the table of critical t values) and the observed t is 2.51, therefore H0 can be rejected.

A t test was able to reveal a statistically reliable difference between the mean of organization factor that have value of (M = 4.1, s = 0.54) and 1, $t(185) = 2.51$, $p < .05$, $\alpha = .05$.

Identification of factors that highly contribute to the acceptance hypothesis is illustrated in Table 4.20. As per results given in t test value table; only two factors affect the success of MIS. "*Requirement information management policy*" and "*Top management supports*" are two major factors and they have contributed for MIS adoption at the Ministry of Education.

According to qualitative data analysis, both factors are significant for the senior management. 99% of the senior managers have pointed out that the major reason for MIS failure is due to the lack of an information management policy at the Ministry of Education.

Table 4.20 .One-Sample statistics for organization factors

Factors	N	Mean	Std. Deviation	Std. Error Mean
Requirement information management policy	186	4.5548	.64540	.04732
Influence on Organization culture	186	3.9032	.86414	.06336
Internal structure and management process	186	3.4946	.86598	.06350
Top management supports	186	4.4180	.87669	.06428
Work environmental	186	3.9301	.74907	.05492
One-Sample Test				
Factors	Test Value = 4			Factor Contribution
		95% Confidence Interval of the Difference		

	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper	
Information management Policy	11.724	185	.000	.55484	.4615	.6482	Reject **H0**
Organization Culture	-1.527	185	.128	-.09677	-.2218	.0282	Accept **H0**
Management Process	-7.959	185	.000	-.50538	-.6306	-.3801	Accept **H0**
Top Management Support	6.503	185	.000	.41801	.2912	.5448	Reject **H0**
Internal work environment	-1.273	185	.205	-.06989	-.1783	.0385	Accept **H0**
Rule-critical t value is less than the observed t AND the means are in the right order, then we can reject H0							
Degrees of freedom	**185**						
Probability level	**0.05**						
Critical t for 185 degree	**1.65313**						

4.8. Summary of the hypothesis testing

As per the results analysis of the survey data, three variables were tested to determine the relationship of the dependent variable of "successful adoption of MIS". Among three variables, *there is a significant influence on Technological and People factors on Successful adoption of MIS.*

According to the summary of results analysis of organization variable, MIS adoption in the education sector had no influence on it. As per detailed analysis of the organization factors, two factors have positively contributed for the MIS adoption. Information management policy and top management support are the two factors which have affected the MIS adoption in education. Once an information system (IS) is presented, it has an effect on their framework of use in activity system in an organization. Activity system is defined as a community system which is a combination between a logical collection of activities and processes or tasks that are performed by a group of people in pursuit of a goal (Davies, 2009).

4.9. Validation of survey findings based on interview results

A current survey used mixed methods which combined personal insights gained by qualitative research with quantitative behavioral data to create a new dimension in understanding the problem of research.

A structured interview method was used to collect data from the senior management in the education sector. Questions were categorized into three major areas which have been used in the survey questionnaire. Organization factors, People factors and Technology factors are major areas covered in the structured interview. Results were categorized into the above thematic areas.

Qualitative methods were used to understand the context and create an insight of the current problem and to achieve final objectives. Likert scale results have not revealed some issues and required more clarity on the final results. Hence, results of the quantitative data analysis provide valuable insights for validating the quantitative data analysis output. Three major variables were used to develop instruments for the interview.

4.9.1. Organization Factors

Results of the interview have identified one major factor for the failure of MIS. "*Lack of human resources with management and computer fields and other required specializations*" is a major factor for the organization variable. Results show a few other major factors that contributed for its failure. They are

1. Lack of consistency and complexity of the existing manual systems
2. Non availability of written guidelines and policies
3. Organizational culture, change, and behavior of employee
4. Lack of strategic planning and results based culture
5. Lack of evaluation of environmental aspects in management information systems

A few major issues have been identified in the management process from the interview data analysis. As per the Table 4.21 illustrated, there is more frequent turnover of top managers due to elections and political appointments. Due to lack of a policy, organization's common goals are changing while many of which are intangible or in conflict with one another. 25% of the respondents have pointed out operation issues with different administrative power. Most of the senior managers are not in a position to operationalize any new model or system due to being in the public sector.

Table 4.21. Factor identified in management process

Factor	Number of Responses	%
Head level changes	7	58%
Operation issues with different administrative power	3	25%
Data discontinuity	1	8%
Vertical and horizontal linkages weaknesses	1	8%
Grand Total	12	100%

Furthermore, data discontinuity and weakness of vertical and horizontal linkages were other two factors identified in the management process.

4.9.2. People Factors

Table 4.22 shows the summary of responses for humanistic factors that contribute to the failure of MIS at the Ministry of Education. Most of the managers at senior level have been working only in the education sector and they have had no other exposure. SLEAS officers are working on education and their service has no opportunity in any other ministry. Previous experience and knowledge of information systems and also lack of participation in system development process shows as a major factors in Table 4.21.

Table 4.22 Humanistic factors

Factor	Number of Responses	%
Inadequate education of the users and their previous experience	5	42%
Lack of understanding of managers of software and information systems	5	42%
Lack of participation of managers and users in system design.	5	42%
Resistance to Change	4	33%
Attitude issue	3	25%
Organizational Expertise	1	8%
Training and skills	1	8%

4.9.3. Technological Factors

Figure 4.38 given below illustrates the user-friendliness of the current system which has become a major issue for failure, acceptance by top managers and sustainability.
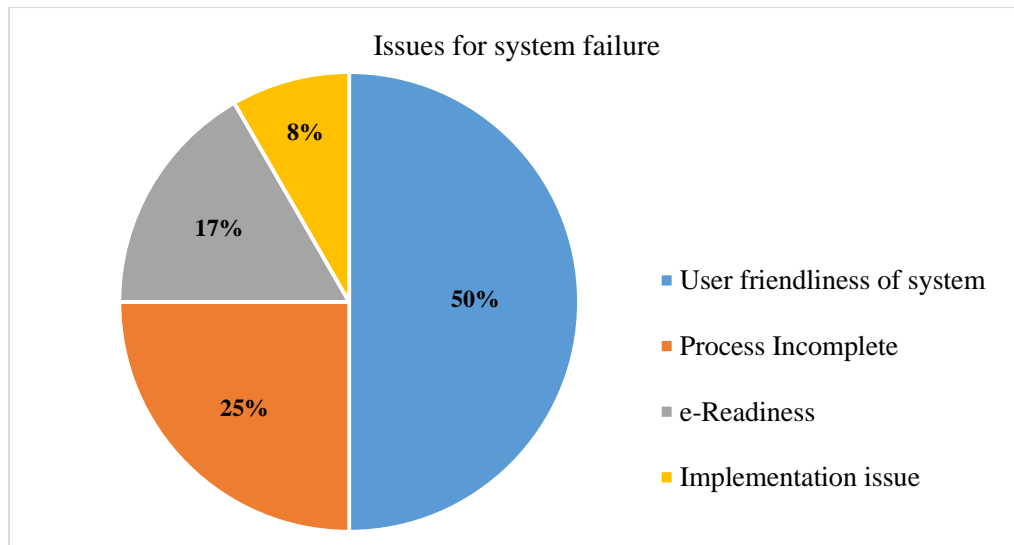
Figure 4.38 Identified issues for system implementation failure

4.10.   Assessment of feasibility of MIS adoption

Today, Information Systems implementation projects are the main challenges in the feasibility of integrated information systems. Failure could be determined by different factors, both from the technological side and organizational side, if not well managed (Pierluigi, 2008). The current study would assess the feasibility of the Ministry of Education based on the survey and interview data. The assessment has helped to develop MIS adoption strategy and reduce the risk of failure in terms of project metrics and operational metrics. In order to understand the current situation of the ministry a SWOT analysis was carried out. The strength, weaknesses, opportunities and Threats that this ministry is facing were identified in order to develop MIS adoption strategies.

4.10.1. Organizational Feasibility

The current study assesses the status of the Ministry of Education in order to implement MIS. If the ministry's problems have not been properly identified and anticipated, it could seriously affect the IT Management staff who are not prepared to deal with the problems, and consequently, increase risk of the failure of the implementation process.

Assessment of the factors was done by using factor analysis or a principal components analysis. The minimum standard should be passed before a factor analysis (or a principal

components analysis). Kaiser-Meyer-Olkin Measure of Sampling Adequacy checked for all such items within an organization dimension. As per the Table 4.23, KMO value is greater than 0.6 and also closer to 1 therefore sample adequacy is very high.

Table 4.23- KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.838
Bartlett's Test of Sphericity	Approx. Chi-Square	1381.993
	df	253
	Sig.	.000

Evaluation of the organization's current strength was done using the extraction method of principal component analysis. Table 4.24 depicts Communalities which is the proportion of each variable's variance that could be explained by the factors. As Table 4.22 illustrates four major areas that could be considered as major areas which strengthens the education sector for the adoption of MIS. As per the results, top management support is a leading factor for the current study. Appendix A, Table A.13 presents the detailed analysis for the following dimensions. Items were extracted for each dimension for a detailed analysis.

Table 4.24: Extraction of factors

Communalities		
Dimension	Initial	Extraction
Top management support	.501	.468
Work environment	.498	.463
Organization culture	.491	.456
Management process	.444	.413

A strong commitment on the part of top management is necessary to ensure a successful implementation project which must be considered a strategic one for the ministry's future. Results of the survey shows that there is a strong commitment on the part of the top management at the Ministry of Education. According to the detailed analysis the following items were significant for the above dimension

1. Management is aware of the benefits that could be achieved by implementing systems

2. Management always supports and encourages to use and implement information system

3. Management always expects a new approach which technology implementation is allowed

4. Management provides the necessary help and resources for the implementation system

Work environment has been ranked as a second feasible dimension within the organization feasibility assessment process. There were two factors highlighted in the respective dimension.

1.   Obtaining support and partnership from external agencies to be allowed
2.   I have been given targets to show my performance monthly, quarterly and annually

Organization culture had been ranked as a third feasible dimension within the organization. Survey results analysis show four major factors for the above dimension.

1.   Organization culture supports IS Implementation and sustainability
2.   Organizational politics do not affect IS implementation
3.   Team for the IS project implementation had been Identified
4.   All employees work better by aligning with the organization towards achieving its vision, mission and goals

Management process is the final feasible dimension. Three major factors were highlighted for the respective dimensions.

1. Frequent transfers of top managers due to elections and political appointments have not affected IS implementation.
2. Current data management process is organized.
3. Strategic planning, budgeting, time-frame and scheduling are organized.

Organization feasibility for different dimensions is in a satisfactory level for the Ministry of Education. Since the organizational factors are one of the most important determinants of successful projects, by understanding their impact and identifying them, it could help planning a systematic IT implementation (Karami, 2014).

Weaknesses

As per the factor analysis results, policy dimension is shown as the weakest area at the ministry. At the moment, MOE has no information management policy. This factor affects to the allocation of budgets, provides clear guidelines and sustainability of the MIS.

Appendix A, Table 14 presents detailed analysis of the weak area in the education sector that lead to failure of MIS.

4.10.2. Technical Feasibility

Technological feasibility was carried out to determine whether the ministry has the capability and readiness for the adaptation of MIS. Five items were used to identify the current status of technological feasibility

Kaiser-Meyer-Olkin Measure of Sampling Adequacy checked all items within the organization dimensions. As per the Table 4.25, KMO value 0.727 is greater than 0.6 and also closer to 1 therefore the sample adequacy is very high.

Table 4.25- KMO and Bartlett's Test

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.829
Bartlett's Test of Sphericity	Approx. Chi-Square	425.828
	Df	10
	Sig.	.000

Table 4.26 presents factors extracted for the strengthening of the organization. As illustrated in Table 4.26, all managers are ready to implement the system as they have infrastructure, HR and data administrators.

Table 4.26 –Extract technological factors

Communalities		
Factor	Initial	Extraction
Technological infrastructure had been established (network, connectivity, etc.)	.587	.562
Data administration infrastructure is ready	.551	.508
Human infrastructure is in place for IS management	.544	.500
Information requirements for the organization had been identified for EMIS	.510	.475
Email communication and Internet usage is common for day to day work	.368	.290

All other factors except for less email communication and Internet usage, are acceptable for IS implementation.

4.10.3. Human factor feasibility

This was one of the most important factors for a successful system implementation. It includes end-users and managers of the system. The systems development would not be successful if the end-users don't accept it.

Kaiser-Meyer-Olkin Measure of Sampling Adequacy checked all items within the organizations dimension. As per the Table 4.27, KMO value 0.780 is greater than 0.6 and also closer to 1 therefore the sample adequacy is very high.

Table 4.27- KMO and Bartlett's Test for people variable

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.780
Bartlett's Test of Sphericity	Approx. Chi-Square	161.543
	Df	36
	Sig.	.000

The degree of resistance to the proposed system, the perceived role of the end users in the development process and the current state of human resources available to conduct the project and also to manage it, are measured under this category. Table 4.28 presents the principal components that have been extracted.

Table 4.28 .Component Matrix

Item	Component 1
I use computers in office work	.910
I use Email and Internet for office work	.875
I can manage excel database and analyses data	.845
I have reliable internet facility in office	.650

Extraction Method: Principal Component Analysis.

a. 1 components extracted.

All factors are at an acceptable level for the system implementation. Computer literacy for new technology adoption is more feasible at the Ministry of Education.

People characteristics are more feasible for IS. Table 4.29 presents the extracted factors which are more feasible for successful implementation. As per the results in Table 4.29, responsibility, perception and usefulness were identified by managers and therefore it would be more feasible than the other four items.

Table 4.29. Extracted values for item

Communalities		
Item	Initial	Extraction
I have the responsibility to involve in the IS development process	1.000	.693
Investment on IS implementation is useful for education	1.000	.691
I would like to share my information with others	1.000	.690
I have many bad experiences in Computer based systems in education. Therefore I cannot trust IS	1.000	.556
Information Systems are easy to be developed and implemented for Education	1.000	.473
TOR/Job description had been defined for manager role in ISM	1.000	.456
Current manual process is more reliable	1.000	.435
Have experience in using various types of IS	1.000	.364
I am accountable for data collection, data processing and system implementation	1.000	.301

According to the extraction value depicted in the above table, five items are not up to level. Their previous experiences are very low and TOR had not been included in the information management process. In addition, the current manual data process is not reliable. Most of the respondents lacked any idea concerning the duty of data management of their particular subject.

1. Information Systems are easy to be developed and implemented for Education
2. TOR/Job description had been defined for manager role in ISM
3. Current manual process is more reliable
4. I have an experience in using various types of IS
5. I am accountable for data collection, data processing and system implementation

4.11. Conclusive Remarks

Chapter 4 dealt with the creation of insights for the survey data to address the research framework model of the thesis. MIS implementation for the Ministry of Education in Sri Lanka is a challenging task that involves human, technical and organizational aspects. In this study, the objective was to identify the factors that affect MIS implementation, assess the current situation at the ministry and develop a strategy for MIS implementation. A summary in this chapter will provide the major points from analysis, and the answers obtained for the research questions.

The result of the analysis in this study regarding the research framework model revealed that when the Ministry of Education had started to implement MIS, there are effects on the organization. It is essential to notice that each of the main three factors (Organization, Technology, and People) affects the MIS implementation process.

As per the results of the hypotheses testing, three variables (Organization, People, and Technology) were tested to evaluate relationship of the dependent variable of "*Successful adoption of MIS*". Analysis of the study found that Technological and People factors had a significant influence on the successful adoption of MIS at the Ministry of Education. Lack of human resources for IT management and software development, information management fields and other required specializations for IT management are major humanistic factors that have been identified by senior managers at the Ministry of Education. Most findings were concerned with the Technology aspect, user-friendliness of the system which have been identified as major factors hindering the success of MIS.

According to a summary of the results analysis of the organization variable, MIS adoption in the education sector had no influence on it. However, the smallest issues are associated with the organization. According to the detailed analysis of the organization factors, two dimensions appear to have positively contributed to the MIS adoption. Organization policy and top management support are two major factors affecting the adoption of MIS in education. An information management policy for the education sector had been identified as a major factor to have an influence on MIS adoption.

According to the analysis of "Assessment of feasibility of the Ministry of Education in order to adopt MIS" indicates that there more concern is about top management support, work

environment, organization culture and management process. Principal component analysis extracted that these four major factors are more feasible factors for organizational feasibility.

According to the assessment of technological feasibility, e-readiness of organization and user-friendliness of system are major factors contributing to MIS implementation.

According to the analysis of "Human Factor feasibility", the current study had found out that managers in the education sector have a positive perception on MIS implementation which previous experience on information systems are most feasible at the Ministry of Education. This is one of the most important factors that contributes to the success of the system implementation.

5. CONCLUSIONS AND RECOMMENDATIONS

5.1. Overview of the chapter

This chapter provides conclusions and recommendations that have been made based on the analysis of statistical results obtained from the current research study. Additionally, this chapter will provide the main findings pertaining to factors affecting the successful adoption of MIS together with identifying key success issues. In addition, assessment of the feasibility in order to implement MIS will be described. Finally, a strategic framework for the successful adoption of MIS will be presented for the policy decision of information management at the Ministry of Education in Sri Lanka.

5.2. Research Implication

The major objective of the current study was to develop a strategy for the successful adoption of MIS for the Ministry of Education in Sri Lanka. The primary objective has been achieved with the help of two supporting objectives.

Based on an in-depth analysis of literature, the current study has identified three major independent variables (Organization, Technology and People) that affect the successful adoption of MIS. These three variables were explained by nine dimensions (11 factors) and those dimensions have not been considered by previous studies. In general, a conceptual framework of the current research study shown in Figure 3.1, was instrumental in analyzing the factors that affect the successful adoption of MIS in education.

Secondly, hypotheses have been formulated to test the relationship between independent and dependent variables. In this research study, the researcher had selected non-directional hypotheses to postulate a relationship between dependent and independent variables. No researcher had ever explored the relationship or difference among these variables and hence there was no basis for indicating direction. In recognition of the various difficulties, time constraints and various responsibilities that the respondents are burdened with, Interview methods was selected as the best method to be utilized for members of the senior management, rather than an online questionnaire survey.

The analysis was done with the help of descriptive statistics, Pearson's correlation analysis and one sample t –Test. SPSS statistical tools were used to analyze data to create insight and address steps in the conceptual framework. Figure 4.1 illustrates the flow of data analysis, methodology and tools that were used by current study.

The first objective of the current study was to identify and explore the major factors that lead to successful adoption MIS. The most important study from this research is that the explanation, in-depth analysis of factors which were categorized into nine major dimensions regarding the implementation of new MIS within the Ministry was presented. Previous studies were evaluated in order to select common and applicable factors for the Ministry of Education in Sri Lanka. Table 3.5 provides details of the variables and dimensions used by the current study. Based on the findings of this study, three major factors; organization, people and technology are factors that affect successful adoption of MIS. As illustrated in Sections 4.10, summary of the hypothesis testing provides the final output of the variable relationship. According to the final results, people and technology were factors that significantly affected the successful MIS adoptions in the Ministry of Education. According to the findings of current study, the Ministry of Education has had previous unsuccessful experiences in numerous IS implementations. Senior management and other top managers pointed out that technology was the major reason for their failure. And also the existing EMIS was found to be not useful for management due to many technological factors.

Most of the researchers are concerned about the factors that influence the successful adoption of MIS. According to Petter (2009), the successful adoption of Information systems in organizations depend mostly on technology characteristics, project and organizational characteristics, user and social characteristics and task characteristics. Shamsuddin & Aziati (2014), pointed out that many factors affect the success of Information system implementation. Those factors were categorized into three categories which are technological factors, organizational factors and people factors. According to Beikzad (2013), three challenges had been identified for the successful implementation of management information systems in the public sector. Furthermore, all existing barriers are divided into humanistic, organizational and environmental factors, the major drawbacks and the reasons of failure and using MIS in public organizations. Organization Structure is an important factor to be considered in technology adoption. Similarly, interaction among

employees at all levels among all divisions and branches is also a necessity for the successful introduction of new technology (Shaukat & Zafar, 2010).

Section 4 in Chapter 3 is provided with reasons for selecting a hybrid model for a current study. Due to complexity of the organization and the administrative setup, the current study has opted to select a mixed model research approach, both quantitative and qualitative. Therefore, the study was able to gain a more complete understanding of the research problem rather than attempting to understand either approaches alone. According to the responses, data collected via online, it was able to cover all island education administration in the current administrative setup. Moreover, a current study was able to answer the confirmatory and exploratory question at the same time, and as a result the study was able to construct and confirm the theory. According to details provided in Table 3.4, this study covered 98 zonal offices and 9 provinces which are geographically distributed unevenly and the current study was able to conduct a complete survey to cover the population of all top level managers.

Quantitative and qualitative statistical tools were used to analyze the responses which were collected via an online survey (186) and interview of the senior managers (12). As presented in Section 4.4 Quantitative analysis techniques were used to analyze the relationship between dimensions (factors), inter items and between variables. Hypotheses tests brought an insight to the accuracy and depth of the research findings. Section 4.7 provided details analysis of hypotheses testing and results. In the present study, according to hypotheses testing, there is a significant influence on Technological and People factors on successful adoption of MIS. Table 4.17 provides the results summary of hypotheses testing. But results of hypotheses 2 organization factor had no relationship between the successful adoptions of MIS for the Ministry of Education. The detailed analysis indicates that the information management policy had a more critical factor for successful adoption of MIS in education. Non availability of clear guidelines with the information management policy was a major factor in the failure of the current system. According to perceptions of the senior management the management process and system implementation required clear guidelines and directions for long term successes. According to the qualitative data analysis findings, "*Lack of human resources with management in computer fields and other required specializations*" was identified as a major factor by senior managers.

Moreover, key factors which affected the successful implementation of MIS, which refers to the success factors to ensure the achievement of MIS implementation were identified. In addition, the feasibility assessment was done for future implementation support and which was used to develop strategy.

Regarding the first research question (Why has MIS Implementation been a failure in the Education Sector?) the current study identifies factors that affect MIS adoption and challenges regarding the implementation in the Ministry of Education. In order to structure these problematic issues under three major variables, this study created a framework based on literature.

The first category contains factors that relates to organization including: Information management policy of organization, lack of top management support and characteristics of the organization. Table 4.7 provides results of descriptive data analysis for policy dimension. Organization culture, internal structures and management, top management supports while work environmental factors were indicated to be highly significant in the current study. Requirements of the policy for information management is a major factor for the success and senior management responses pointed out the same. As per Table 4.9 summary of results, top management support for MIS implementation is significantly positive at the Ministry of Education. Readiness to accept technology is more feasible and top managers are provided with the required resources for the successful MIS implementation. No negative effect could be discerned from the organization culture and internal structure and process of the organization towards MIS adoption. A major highlighted factor is the support from the top management.

The second category combines factors which associate with people such as computer self-competency of managers, perception and people characteristics. In analysis section 4.3.5 present findings pertaining to these factors. Computer self-competency at all levels of managers is significantly high while 97% of managers are competent in operating and using it for office work. As illustrated in section 4.3.5, computer competency assessment of top level managers is a leading factor for technology adoption in education. And also Figure 4.13 presented an evaluated, data analysis capacity of top level managers using computers. Figure 4.10 provides internet and email usage which is also significantly high in office work by top the management at the Ministry of Education. According to the findings based on the analysis, all levels of management have the capacity for data analytical culture and their

capacity is also significantly high. It should be further noticed that, perception of the top level managers on MIS implementation have a positive correlation. Table 4.10 illustrates correlation between top managers in IT literacy and management support towards the new approach with their computer self-competency. Previous experience in using various types of IS, job role and responsibility in information systems is not significant for the current study. And also, the current study indicates that some areas in people characteristics have a high significance in current working environment. Managers' perception on MIS implementation for the Ministry of Education is positive which would have an impact on the successful adoption of MIS.

The third category focuses on technological factors which consist of e-Readiness of the Organization, existing System Information quality, System Quality and Service quality. According to a current study assessment of e-Readiness which is the Ministry's ability to take advantage of the ICTs as a facility to enhance and improve its administrative functions are not feasible. Table 4.12 presents the current status of the facilities at all levels of the Ministry of Education. Infrastructure, human resources, and legal and policy framework and other resources are gray areas and barriers for the MIS adoption process. Results of the current study indicated the, lack of human resources with management and computer fields is a major issue for IS implementation and sustainability at the Ministry of Education. According to the analysis of data of the current study, quality of existing education management system, quality of information and quality of service are highly influential to functionality. Table 4.11 provides assessment of the functionality of the existing education management system.   According to the assessment of the current study, education management information system had not provided the information for decision making process. Many efforts have been made to restore EMIS and at present operationalization had been a failure.

Based on the second research question, "What are the key factors that need to be identified in order to achieve a successful MIS implementation?" it can be concluded that, there are various factors that need to be presented in MIS implementation. Current study has made an assessment on feasibility of the Ministry of Education for MIS adoption. At the time of the survey, most feasible factors that are available, top management support, higher computer competency of top level managers, and supportive culture of organization and people factors were not negatively affected. Most of the previous studies had shown that top

management support is a significant factor for technology adoption which leads to more success IT use in many organizations. It is important to create a supportive climate and adequate resources for the adoption of new technology (Premkumar & Roberts, 2005).

Managers of the organization should understand the effects, in order to design and implement information systems that provide only benefits for the organization, and to avoid the risks that occur from IS tools (Davies, 2009). In addition to feasibility factors, a few major factors contributed to the failure of the education management system during the last few years. Among them, e-readiness, management process, system quality, information quality and service quality of the existing system have been identified as highly significant for the Ministry. The findings of the current study indicated that e-readiness is not in an acceptable level for MIS adoption. According to the survey results, reliable internet connectivity was a major issue for the education sector at all three levels covered in this study.

Pearson's' Correlation had been done to assess the inter variable and inter dimensions correlation. As indicated in Table 4.13, Organization, People and Technology are positively correlated to each other. Technology variable is highly significant than the other two variables.

As per Table 4.15 results an analysis of the survey data, three variables were tested for the relationship with the dependent variable of "successful adoption of MIS". Among three variables, there is a significant influence of Technological and People factors on the successful adoption of MIS.

Table 4.13 provides a summary of the results analysis of the organization variable, and MIS adoption in education sector had no influence on it. As per detail analysis of the organization factors, two factors have positively contributed to the MIS adoption. Organization policy and top management support are two factors which affected the MIS adoption in education. Once an information system (IS) is introduced, it affects their context of use in activity system in an organization. Activity system is defined as a community system which is a combination between a logical collection of activities and processes or tasks that performed by a group of people in pursuit of a goal (Davies, 2009).

5.3. MIS adoption strategy

To develop a MIS adoption strategy for successful Implementation

The main and final objective of the current study was to develop a MIS adoption strategy for the Ministry of Education. Based on the summary depicted in Table 4.23 a strategic analysis of the study situation of the organization was done where opportunities and weaknesses were identified. Figure 5.1 presents the strategic model for the Ministry of Education. It also assesses the internal and external situation required to formulate and implement the strategy. Strategic implementation and operational plans have been aligned with long term objectives. As per results of the current study, sustainable and a long term operation model is presented in Figure 5.1.

Steps of strategy into operation

Step 01- Understand the current states of the ministry of education and review the feasibility of the technology people and the organization. Design the requirements and identify the gaps from current level to be filled.

Step 02-Strategic analysis for all factors that affects MIS implementation should be analyzed. The strategic capability of the organization were assessed which were up of resources and competences that the ministry have. Assessment should be done for the strategic capability of the ministry by considering its strength and weaknesses organization, technology and people factors.

Step 03- **Strategic choices and Strategic Formulation**

Formulate and implement a strong ICT policy frame work for education and Implementation of policies that are supported to ISM major strategy in the current scenario. Overall objectives of the organization is a major part of strategic information system planning process.

Step 04- Strategy Implementation

According to literature, implementing a strategy occurs when a company adopts policies and organizational practices that are consistent with its strategy (Barney, 2007). An information management policy of the ministry will guide the smooth implementation process and will affect the management process, organization culture and provide benefits to the organization.

Opportunities and Threats
- Technology
- Government ICT Policy
- Management style and process
- Government Pressure for EMIS

EDUCATION MANAGEMENT INFORMATION SYSTEM ADOPTION STRATERGY FOR MINISTRY OF EDUCATION

Mission Statement

Identification of factors that affect the successful adoption of MIS

Strategic Analysis
1. Organization Issue
   a. IM Policy
2. Technological Issues
   a. E-Readiness
3. People's Issue
   a. lack of human resources

Strategic Formulation
- Formulate and implement strong ICT policy frame work for education
- Implementation of policies that are supported to ISM

Long term objectives
- Successful Implementation
- Ensure sustainability of education Management system for Education ministry

Implementation
- Development of comprehensive business process re-engineering plan for Education Ministry
- Allocation of resources
- Establish an organization structure for ISM
- Aware of benefits and stakeholder participation
- Design, development and Implementation of system with all levels of users and beneficiaries

Operational Plan
- Allocation of budget
- Appoint MIS champions at each level
- Implement strong MIS Implementation monitoring plan at all levels

Internal Strength
- Top management support
- Managers' IT competency
- Organization process
- Organization culture
- Work environment

Internal Weakness
- Lack of Information Management policy
- Lack of Skills human resources
- Training opportunity
- Existing system

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Figure 5.1 MIS adoption strategy for education ministry

5.4. Recommendations for future research

Further research could be carried out for an in-depth analysis of the current topic of "*Identification of factors that affect successful adoption of MIS for education sector*" The project did not exhaustively cover all areas of organizational, technology and people variables that affect the implementation of information systems. Future research could be done to investigate the different dimensions within the Ministry of Education and probably provide more insight for each variable on the best framework for the adaptation of information systems.

5.5. Concluding remarks

There were two research objectives associated with the current study. They are;

- Why has the implementation of MIS been a failure in the Education Sector?
- What are the key factors that need to be identified in order to achieve the successful implementation of MIS?

In answering these two questions or problems three research objectives have been initiated.

<u>**Research objective 1**</u>

To identify and explore the major factors that lead to successful adoption MIS

The present study had carried out an in-depth analysis of literature review in the field of importance of EMIS in the education sector, EMIS Implementation challenges, major issues of MIS implementation in the public sector, factors that affect MIS implementation, factors causing the successful or unsuccessful implementation of information systems, the impact of organizational factors on management information system, MIS adoption strategies, adoption models and frameworks. Research variable and their significance in previous research were deeply analyzed and expert judgment was obtained in order to formulate a research framework. Based on the research

findings, major factors and their various dimensions that affect the successful adoption of MIS in the Ministry of Education have been identified. Therefore the present study had successfully substantiated this research objective.

Research objective 2

To assess the feasibility of the Ministry in order to adopt MIS

Based on the current study, the assessment of the Ministry of Education had identified the current level of technological feasibility, organizational feasibility, and human factor feasibility. Technological feasibility has been assessed based on various types of factors such as resources, e-readiness and others. Organization feasibility had been assessed based on readiness of the organization for technology acceptance. Human factor feasibility had been assessed based on technical competencies and human characteristics. The study was able to identify factor feasibility to develop a strategy.

Research objective 3

To develop a MIS adoption strategy for its successful Implementation

The ultimate objective of this research study is to develop an implementation strategy for MIS at the Ministry of Education. Previous studies on MIS implementation had developed a model in a different manner. Based on objectives 1 and Objectives 2, a results strategy had been developed for future support. Figure 5.1 presents a MIS adoption strategy model for the successful implementation at the ministry of Education. Therefore, the present study had successfully substantiated this ultimate research objective.

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APPENDIX A: SUMMARY TABLES OF THE DESCRIPTIVE STATISTICS

Table A.1- Descriptive statistics for work environmental factors

Item	N	Mode	Range	Minimum	Maximum	Sum	Mean Statistic	Std. Error	Std. Deviation	Variance	Skewness Statistic	Std. Error
I have been given a target to show my performance monthly, quarterly, annually	186	5	5	1	6	758	4.08	.093	1.267	1.605	-.772	.178
Obtaining support and partnership from external agencies are allowed	186	5	5	1	6	733	3.94	.094	1.278	1.634	-.453	.178
Planning processes are done based on a feasibility study and analysis of data from various sources	186	5	5	1	6	765	4.11	.093	1.262	1.593	-.672	.178
I am responsible for monitoring output results and giving a feedback	186	5	4	2	6	942	5.06	.062	.849	.720	-1.465	.178
I am aware what other branches do and we always share information	186	4	5	1	6	760	4.09	.094	1.279	1.636	-.617	.178
I have authority to introduce technology, systems without obtaining permission from the senior manager	186	5	5	1	6	725	3.90	.103	1.401	1.962	-.532	.178
I have been trained (Foreign/Local)) on MIS, monitoring systems, information systems	186	2	5	1	6	434	2.33	.104	1.417	2.007	1.099	.178
Valid N (listwise)	186											

Table A.2. Distribution of frequency

I have been given target to show my performance monthly, quarterly, annually

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	6	3.2	3.2	3.2
	Disagree	27	14.5	14.5	17.7
	Slightly disagree	13	7.0	7.0	24.7
	Slightly agree	53	28.5	28.5	53.2
	Agree	75	40.3	40.3	93.5
	Strongly Agree	12	6.5	6.5	100.0
	Total	186	100.0	100.0	

Table A.3 Obtaining support and partnership from external agencies are allowed

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	3	1.6	1.6	1.6
	Disagree	36	19.4	19.4	21.0
	Slightly disagree	19	10.2	10.2	31.2
	Slightly agree	51	27.4	27.4	58.6
	Agree	65	34.9	34.9	93.5
	Strongly Agree	12	6.5	6.5	100.0
	Total	186	100.0	100.0	

Table A.4. Planning processes are done based on feasibility study and analysis of data from various sources

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	5	2.7	2.7	2.7
	Disagree	25	13.4	13.4	16.1
	Slightly disagree	16	8.6	8.6	24.7
	Slightly agree	55	29.6	29.6	54.3
	Agree	68	36.6	36.6	90.9
	Strongly Agree	17	9.1	9.1	100.0
	Total	186	100.0	100.0	

Table A.5. I am responsible for monitoring output results and give feedback

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	5	2.7	2.7	2.7
	Slightly disagree	5	2.7	2.7	5.4
	Slightly agree	16	8.6	8.6	14.0
	Agree	107	57.5	57.5	71.5
	Strongly Agree	53	28.5	28.5	100.0
	Total	186	100.0	100.0	

Table A.6. I am aware what other branches do and we always share information

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	7	3.8	3.8	3.8
	Disagree	21	11.3	11.3	15.1
	Slightly disagree	19	10.2	10.2	25.3
	Slightly agree	61	32.8	32.8	58.1
	Agree	58	31.2	31.2	89.2
	Strongly Agree	20	10.8	10.8	100.0
	Total	186	100.0	100.0	

Table A.7. I have authority to introduce technology, systems without getting permission of senior manager

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	12	6.5	6.5	6.5
	Disagree	27	14.5	14.5	21.0
	Slightly disagree	24	12.9	12.9	33.9
	Slightly agree	43	23.1	23.1	57.0
	Agree	65	34.9	34.9	91.9
	Strongly Agree	15	8.1	8.1	100.0
	Total	186	100.0	100.0	

Table A.8. I have been trained (Foreign/Local)) on MIS, monitoring systems, information systems

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	60	32.3	32.3	32.3
	Disagree	72	38.7	38.7	71.0
	Slightly disagree	17	9.1	9.1	80.1
	Slightly agree	12	6.5	6.5	86.6
	Agree	19	10.2	10.2	96.8
	Strongly Agree	6	3.2	3.2	100.0
	Total	186	100.0	100.0	

Table A.9. People Characteristics

Item	N	Range	Minimum	Maximum	Sum	Mean		Std. Deviation	Variance	Skewness	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic	Statistic	Std. Error
Have an experiences in using the various types of IS	185	4	2	6	820	4.43	.075	1.020	1.040	-.669	.179
Information System are easy to be developed and implemented for Education	185	5	1	6	796	4.30	.096	1.300	1.690	-.564	.179
TOR/Job description has been defined for manager role in ISM	185	5	1	6	621	3.36	.100	1.360	1.850	-.067	.179
Current manual process is more reliable	185	5	1	6	670	3.62	.090	1.228	1.508	-.205	.179
I am accountable for data collection, data processing and system implementation	185	5	1	6	847	4.58	.087	1.182	1.397	-1.047	.179
Investment on IS implementation is useful for education	185	4	2	6	934	5.05	.069	.940	.883	-1.368	.179
I would like to share my information with other	185	5	1	6	964	5.21	.062	.849	.722	-1.924	.179
I have many bad experience in Computer based system in education. Therefore I cannot trust IS	185	5	1	6	611	3.30	.102	1.393	1.940	.164	.179
I have limited responsibility to involve in IS development process	185	5	1	6	692	3.74	.093	1.267	1.606	-.569	.179
Valid N (listwise)	185										

Table A.10.Descriptive statistics for people factors

		Have an experiences in using the various types of IS	Information System are easy to be developed and implemented for Education	TOR/Job description has been defined for manager role in ISM	Current manual process is more reliable	I am accountable for data collection, data processing and system implementation	Investment on IS implementation is useful for education	I would like to share my information with other	I have many bad experience in Computer based system in education. Therefore I cannot trust IS	I have limited responsibility to involve in IS development process
N	Valid	185	185	185	185	185	185	185	185	185
	Missing	1	1	1	1	1	1	1	1	1
Mean		4.43	4.30	3.36	3.62	4.58	5.05	5.21	3.30	3.74
Median		5.00	5.00	4.00	4.00	5.00	5.00	5.00	3.00	4.00
Mode		5	5	4	4	5	5	5	2	5
Std. Deviation		1.020	1.300	1.360	1.228	1.182	.940	.849	1.393	1.267
Variance		1.040	1.690	1.850	1.508	1.397	.883	.722	1.940	1.606
Skewness		-.669	-.564	-.067	-.205	-1.047	-1.368	-1.924	.164	-.569
Std. Error of Skewness		.179	.179	.179	.179	.179	.179	.179	.179	.179
Sum		820	796	621	670	847	934	964	611	692
Percentiles	25	4.00	3.00	2.00	2.00	4.00	5.00	5.00	2.00	3.00
	50	5.00	5.00	4.00	4.00	5.00	5.00	5.00	3.00	4.00
	75	5.00	5.00	4.00	4.00	5.00	6.00	6.00	5.00	5.00

Table A.11: Extraction of strong factors- Organization

Dimension	Item	Initial	Extraction
	Communalities		
Internal structure and management process	Frequent transfers of top managers due to elections and political appointments have not affected for IS implementation	.453	.391
	Current data management process is organized	.472	.391
	Strategic planning, budgeting, time-frame and scheduling are Organized-	.478	.419
Organization Culture	Organization culture supports IS Implementation and sustainability	.425	.358
	Organizational politics does not affect to IS implementation	.431	.368
	Team for the IS project implementation has been Identified	.499	.406
	All employees are working better aligning the organization towards achieving its vision, mission, and goals	.488	.429
Top Management Support	Management is aware of the benefits that can be achieved by implementing systems	.448	.384
	Management always supports and encourages to use and implement information system	.475	.409
	Management always expect new approach and technology implementation is allowed	.589	.528
	Management provides necessary help and resources to implementation system	.580	.535
Work Environment	Obtaining support and partnership from external agencies are allowed	.501	.415
	I have been given target to show my performance monthly, quarterly, annually	.484	.421

Table 12: Extraction of weak factors- Organization

Dimension	Communalities		
	Item	Initial	Extraction
Organization Culture	Training opportunities on monitoring and evaluation, information management are provided to everyone in the organization	.403	.324
Internal structure and management process	Political factors do not negatively affect MIS Implementation	.421	.319
Organization Culture	Possible champions can be identified at all levels -National, Provincial, Zonal	.351	.305
Work Environment	Planning processes are done based on feasibility study and analysis of data from various sources	.362	.297
Internal structure and management process	Most of managerial positions have decision- making autonomy	.314	.258
Requirement of information management policy for organization	Annual budgets are allocated for ISM	.286	.215
	Systems can be developed without any donor push (ADB,WB,JICA)	.272	.214
	Information management policy is necessity for education	.281	.171
	Auditors legally accept electronic files	.175	.092
	MIS is essential for running and managing education today	.141	.070

Table A.13 Factor Analysis

Item	Information management policy is necessity for education	Annual budgets are allocated for ISM	MIS is essential for running and managing education today	Systems can be developed without any donor push (ADB,WB,JICA	Auditors legally accept electronic files
Information management policy is necessity for education	1.000	.227	.122	.217	.112
Annual budgets are allocated for ISM	.227	1.000	-.056	.260	.256
MIS is essential for running and managing education today	.122	-.056	1.000	.157	-.034
Systems can be developed without any donor push (ADB,WB,JICA	.217	.260	.157	1.000	.140
Auditors legally accept electronic files	.112	.256	-.034	.140	1.000

Table A.14. Reproduced Correlations

		Information management policy is necessity for education	Annual budgets are allocated for ISM	MIS is essential for running and managing education today	Systems can be developed without any donor push (ADB,WB,JICA	Auditors legally accept electronic files
Reproduced Correlation	Information management policy is necessity for education	.432[a]	.349	.314	.469	.223
	Annual budgets are allocated for ISM	.349	.601[a]	-.148	.379	.521
	MIS is essential for running and managing education today	.314	-.148	.731[a]	.339	-.265
	Systems can be developed without any donor push (ADB,WB,JICA	.469	.379	.339	.508[a]	.244
	Auditors legally accept electronic files	.223	.521	-.265	.244	.479[a]
Residual	Information management policy is necessity for education		-.122	-.192	-.251	-.111
	Annual budgets are allocated for ISM	-.122		.092	-.120	-.266
	MIS is essential for running and managing education today	-.192	.092		-.182	.231
	Systems can be developed without any donor push (ADB,WB,JICA	-.251	-.120	-.182		-.103
	Auditors legally accept electronic files	-.111	-.266	.231	-.103	

Extraction Method: Principal Component Analysis.

a. Reproduced communalities

b. Residuals are computed between observed and reproduced correlations. There are 10 (100.0%) no redundant residuals with absolute values greater than 0.05.

APPENDIX B-SURVEY QUESTIONNAIRE

SURVEY ON IDENTIFICATION OF FACTORS AFFECTING THE SUCCESSFUL ADOPTION OF MIS FOR EDUCATION SECTOR

Note: All data is accessed and owned by the researcher and take the protection of your personal data very seriously. Your data will not be disclosed publicly by us, nor transferred to any third parties without your consent.

A-DEMOGRAPHIC INFORMATION

1. Current Workplace-ඔබ වර්තමානයේ රැකියාව කරන ස්ථානය: MoE/Province/Zone
2. Age වයස:
3. Gender: MALE OR FEMALE
4. Current Position: DE . DD . AD. APD
5. Subject Area:
6. Educational Qualifications: PhD/Master/Degree/PGDM
7. Email:…………………………..

1. Computers usage in office hours-පරිගණක භාවිතය (Measure Computer Self efficiency)

Usage	Not at all -භාවිත නොකරයි	To a small extent ඉතා අඩුවෙන්	To some extent යම්තාක් දුරට	To moderate extent සාමාන්‍යයෙන්	To large extent උපරිමයෙන් භාවිතාවේ
a).I use computers in office environment-කාර්යාල කටයුතුවලදී පරිගණකයක් භාවිත කරයි					
b).I use Email and Internet for office work-කාර්යාල කටයුතුවලදී අන්තර්ජාලය,ඊ මෙල් භාවිත කරයි					
c).I can manage excel database and analyses data - කාර්යාල කටයුතුවලදී Excel දත්ත පද්ධති භාවිතකර විශ්ලේෂණය කරයි					
d).I have a reliable internet facility in office (Wired/Wireless/other)-මා හට විශ්වසනීය අන්තර්ජාල පහසුකම් ඇත					

අදාළ කොටුවේ හරි ලකුණ (✔) යොදන්න
Indicate the Level of Agreement according to the 6 point Likert Scale: (*Use* ✔ *Mark in relevant cell*)
Scale --   6- *Strongly Agree*   5- *Agree*   4- *Slightly agree*   3- *Slightly disagree*   2- *Disagree*   1- *Strongly Disagree*

B-IDENTIFICATION OF FACTORS

1. **Requirement information management policy and resources for the implementation of MIS at Ministry/Province/Zone-**තොරතුරු තාක්ෂණ ප්‍රතිපත්තිවල අවශ්‍යතාවය

Information Management Policy measures	Strongly Agree	Agree	Slightly agree	Slightly disagree	Disagree	Strongly Disagree
a) Information management policy is a necessity for education -තොරතුරු කළමනාකරණය සඳහා ප්‍රතිපත්තියක් අධ්‍යාපන අමාත්‍යාංශයට අවශ්‍යය						
b) Annual budgets are allocated for ISM-තොරතුරු කළමනාකරණය සඳහා වාර්ෂිකව මුදල් වෙන්කරයි						
c) MIS is essential for running and managing education today-කළමනාකරණ තොරතුරු පද්ධතියක් අධ්‍යාපනයට අද අත්‍යවශ්‍යය						
d) Systems are developed without any donor push (ADB,WB,JICA)-විදේශ ආධාර ව්‍යාපෘතිවල සහයක් නැතිව පද්ධති සැකසීම ආරම්භ කර ඇත						
e) Auditors legally accept electronic files-විගණනයේදී පරිගණකගත ලිපිගොනු පිළිගනු ලබයි.						

2. **Influence on Organization culture for MIS Implementation -**තොරතුරු පද්ධතියක් ස්ථාපිත කිරීමට ආයතන සංස්කෘතියේ බලපෑම

Organization Culture measures	Strongly Agree	Agree	Slightly agree	Slightly disagree	Disagree	Strongly Disagree
a) Possible champions can be identified at all levels (National, Provincial, Zonal)-තොරතුරු පද්ධති ක්‍රියාත්මක කිරීමේදී ඕනෑම මට්ටමකදී කැපවී වැඩ කල හැකි අයෙකු/ හැකියාවන් නායකත්වය ඇති පුද්ගලයෙකු සොයාගත හැකිය						
b) Organization culture supports MIS Implementation and sustainability-ආයතනයේ සංස්කෘතිය තොරතුරු පද්ධති ක්‍රියාත්මක සඳහා සහය දක්වයි.						
c) Team for the IS project implementation has been Identified- තොරතුරු පද්ධති ක්‍රියාත්මක කිරීමට ඒ සඳහා වෙනම කණ්ඩායමක් ඇත/හඳුනගනා ඇත						
d) Organizational politics does not affect the IS implementation- ආයතනයේ පුද්ගලයන්ගේ කණ්ඩායම් මතිමතාන්තර තොරතුරු පද්ධති ක්‍රියාත්මක කිරීමට බල නොපායි						

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	Organization Culture measures	Strongly Agree	Agree	Slightly agree	Slightly disagree	Disagree	Strongly Disagree
e)	All employees are working better aligning the organization towards achieving its vision, mission, and goals-ආයතනයේ සියලුදෙනා වැඩ කරනුයේ ආයතනයේ ඉලක්කයන් ලඟාකර ගැනීමේ චේතනාවෙනි						
f)	Training opportunities on monitoring and evaluation, information management are provided to everyone in the organization-නියාමනය සහ තොරතුරු කළමනාකරණය සම්බන්ධ පුහුණු අවස්ථා හැමෝටම ලබා දෙයි						

3. **Assessment of Internal structure and management process** අභ්‍යන්තර පරිපාලන ව්‍යුහය සහ ක්‍රියාවලිය

	Management process measures	Strongly Agree	Agree	Slightly agree	Slightly disagree	Disagree	Strongly Disagree
a)	Current data management process is organized-වර්තමාන දත්ත කළමනාකරණ ක්‍රියාවලිය සංවිධානාත්මකය						
b)	Political factors do not negatively affect MIS Implementation-දේශපාලනය සහ කාර්යාල පරිසරය තොරතුරු පද්ධති ක්‍රියාත්මක කිරීමට බලනොපායි						
c)	Strategic planning, budgeting, timeframe and scheduling are Organized - සැලසුම්කිරීම,මුදල්වෙන්කිරීම වඩාත් සංවිධානාත්මකය						
d)	Most managerial positions have decision- making autonomy-බොහොමයක් නිලධාරීන්ට තනිව තීරණ ගැනීමට බලයක් ඇත.						
e)	Frequent transfers of top managers due to elections and political appointments have not affected IS implementation-නිරන්තර සිදුවන ඉහළ නිලධාරීන්ගේ ස්ථාන මාරු පද්ධති ක්‍රියාත්මක කිරීම බලනොපායි						

4. **Indicate the levels of top management supports for IS Adaptation-** ඉහළ කළමනාකරණයේ සහය

	Top management supports measures	Strongly Agree	Agree	Slightly agree	Slightly disagree	Disagree	Strongly Disagree
a)	Management is aware of the benefits that can be achieved by implementing systems-තොරතුරු පද්ධතිය භාවිතය නිසා ඇතිවන ප්‍රතිඵලය සහ බලපෑම පිළිබඳ අවබෝධයක් ඇත						
b)	Management always supports and encourages to use and implement information system-කළමනාකාරිත්වය තොරතුරු පද්ධති ක්‍රියාත්මකවනු දැකීමට කැමතිය						

		Strongly Agree	Agree	Slightly agree	Slightly disagree	Disagree	Strongly Disagree
c)	Management provides necessary help and resources to implementation system-කළමනාකරණයෙන් තොරතුරු පද්ධති ස්ථාපිත කිරීමට අවශ්‍ය සම්පත් ,සහය උපරිමයෙන් ලැබේ						
d)	Management always expect new approach and technology implementation which is allowed-කළමනාකරණය නිතරම තාක්ෂණය සහ නව ප්‍රවේශයන් පිළිබඳ උනන්දුය ,කැමතිය. ඒ සඳහා ඉඩ ලබාදෙයි						

5. **Assessment work environmental factors** වැඩ පරිසරයේ බලපෑම

	Work environment factor measures	**Strongly Agree**	**Agree**	**Slightly agree**	**Slightly disagree**	**Disagree**	**Strongly Disagree**
a)	I have been given a target to show my performance monthly, quarterly, annually-සෑම අයෙකුටම මාසිකව කාර්තුමය ඉලක්කයක් ලබාදී ඇත.						
b)	Obtaining support and partnership from external agencies to develop IS are allowed-තොරතුරු පද්ධති සැකසීමට බාහිර ආයතනවල සහය ලබාගැනීමට බාධාවක් තොමැත						
c)	Planning processes are done based on a feasibility study and analysis of data from various sources- වාර්ෂික සැලසුම් සකස් කිරීම ශක්‍යතා අධ්‍යනය සහ දත්ත විශ්ලේෂණ කිරීමෙන් පසු සිදු කරයි						
d)	I am responsible for monitoring output results and giving a feedback-නියාමනය සහ ප්‍රතිපෝෂණය රාජකාරියේ වගකීමකි						
e)	I am aware of what other branches do and we always share information -අනෙක් අංශ සිදුකරන දේ පිළිබඳ දැනුවත්ය තොරතුරු හුවමාරු කරයි						
f)	I have the authority to introduce technology, systems without getting permission of senior manager- නව තාක්ෂනය තොරතුරු පද්ධති හඳුන්ව දීම, ක්‍රියාත්මක කිරීමට බලයක් ඇත						
g)	I have been trained (Foreign/Local)) on MIS, monitoring systems, information systems-නියාමනය සහ තොරතුරු පද්ධති කළමනාකරණයට දේශීය හෝ විදේශීය පුහුණුවක ලබා ඇත						

6. **Assessment of e-Readiness of the Organization** තොරතුරු පද්ධති ස්ථාපිත කිරීම සඳහා ආයතනයේ සූදානම

e-Readiness measures	Strongly Agree	Agree	Slightly agree	Slightly disagree	Disagree	Strongly Disagree
a) Data administration infrastructure is ready-දත්ත පාලන යටිතලපහසුකම් සූදානමීය						
b) Human infrastructure is in place for IS management - අවශ්‍ය හැකියාවන් ඇති නිලධාරීන් ස්ථානගතව ඇත						
c) Technological infrastructure has been established (network, connectivity, etc..)- අවශ්‍ය තාක්ෂණික යටිතපහසුකම් (අන්තර්ජාලය, පරිගණක, සහ වෙනත්) ස්ථාපිත කර ඇත						
d) Email communication and Internet usage is common for day today work-දැනටමත් ඊමේල් සහ අන්තර්ජාල භාවිතය ඉහලය						
e) Information requirement for organization has been identified for EMIS -ඔබ ආයතනයේ තොරතුරු පද්ධතියක් සැකසීම සඳහා අවශ්‍යතාවය නිවැරදිව හඳුනගන ඇත						

7. **Assessment of people characteristics of the organization** ආයතනයේ පුද්ගලයන්ගේ බලපෑම

People Characteristics measures	Strongly Agree	Agree	Slightly agree	Slightly disagree	Disagree	Strongly Disagree
a) I have an experiences in using various types of IS -කාර්යාල කටයුතුවලදී තොරතුරු පද්ධති භාවිත කර පළපුරුද්දක් ඇත						
b) Information Systems are easy to be developed and implemented for Education -අධ්‍යාපන අමාත්‍යංශයේ කළමනාකරණයට තොරතුරු පද්ධති සැකසීම, ක්‍රියාත්මක කිරීම පහසුය						
c) TOR/Job description has been defined for manager role in ISM-තොරතුරු කළමනාකරණය සම්බන්ධ වගකීම රැකියා විස්තරයේ ඇතුලත්ය						
d) Current manual process is more reliable-වර්තමාන භාවිතාකරන දත්ත රැස්කිරීම ,විශ්ලේෂණය, වඩාත් විශ්වසනියය						
e) I am accountable for data collection, data accuracy , system implementation-දත්ත රැස්කිරීම, පද්ධති ක්‍රියාත්මක කිරීම මගේ වගකීමක්ය						
f) Investment on IS implementation is useful for education-දත්ත පද්ධති සඳහා ආයෝජනය ප්‍රයෝජනවත්ය						

People Characteristics measures	Strongly Agree	Agree	Slightly agree	Slightly disagree	Disagree	Strongly Disagree
g) I would like to share my information with other departments-අනෙක් අංශයන් සමඟ දත්ත තොරතුරු හුවමාරුවට කැමතිය						
h) I have many bad experience in Computer based system in education. Therefore I cannot trust IS- අමිහිරි අත්දැකීම් නිසා පද්ධති පිළිබඳ විශ්වාසයක් නැත						
i) I have limited responsibility to be involved in IS development process- පද්ධති සැකසීමට සහ ක්‍රියාත්මක කිරීමට මැදිහත්වීමට ට ඇති වගකීම අඩුය						

8. **Assessment of system and information qualities of current Education Management Information System (NEMIS) -** දැනට සකස්කර ඇති භාවිතාකරන තොරතුරු පද්ධතියේ (**NEMIS**) තත්ත්වය

System quality measures	Strongly Agree	Agree	Slightly agree	Slightly disagree	Disagree	Strongly Disagree
a) NEMIS is easy to use-මෙය භාවිතයට පහසුය						
b) NEMIS is easy to learn-මෙය ඉගෙනීමට පහසුය						
c) NEMIS is reliable-මාහට විශ්වසනීය පද්ධතියකි						
d) NEMIS covers my requirements- අප ආයතනයේ සියලුම අංශයන් ආවරණය කර ඇත						
e) NEMIS provides relevant information- මාහට අදාළ තොරතුරු ලබාගත හැක						
f) Information in NEMIS is accurate and reliable-දැනට ලැබෙන තොරතුරු විශ්වසනීයයි						
g) NEMIS information is useful for decision making-මාහට තීරණ ගැනීමට උදව් වේ						
h) NEMIS provides timely information- අවශ්‍ය වෙලාවට අවශ්‍ය තොරතුරු ලබාගත හැකිය.						

9. **Assess the level of service quality that you received from the technical support team-** දැනට සකස්කර ඇති තොරතුරු පද්ධතියේ තාක්ෂණික සේවා සපයන කණ්ඩායම්වල සහය

EMIS technical team Service quality measures	Strongly Agree	Agree	Slightly agree	Slightly disagree	Disagree	Strongly Disagree
a) NEMIS technical team provids prompt service to users- මෙම පද්ධතියට අදාළව සේවා සපයන තාක්ෂණික කණ්ඩායම ක්ෂණික සේවාවක් සපයයි						

b)	Satisfied with NEMIS technical team Service- ඔවුන්ගේ තාක්ෂණික සේවාව ගැන සෑහීමකට පත්වේ						
c)	Satisfied with NEMIS technical team knowledge-පද්ධතිය පිලිබඳ ඔවුන්ට තාක්ෂණික දැනුම පවතී						
d)	NEMIS technical team has a good relationship with users -එම කණ්ඩායම භාවිත කරන්නන් ට නිතර උදව් කරයි						
e)	NEMIS Technical team Feedback mechanism is acceptable- එම කණ්ඩායම ප්‍රතිපෝෂණ ක්‍රියාවලිය ඉතා හොඳින් කරයි						
f)	Training provided by NEMIS Technical team is good and sufficient -පද්ධතිය පිලිබඳ ලබා දුන්පුහුණුව ප්‍රමාණවත්						

10. Functionality of Education Management Information System (EMIS/NEMIS) -අධ්‍යාපන තොරතුරු කළමනාකරණ පද්ධතිය ක්‍රියාත්මක ද නැතිද

EMIS technical team Service quality measures	Yes	No
a) EMIS is not working at the moment- දැනට තොරතුරු පද්ධතිය ක්‍රියාත්මක නැත		
b) Many efforts have been made to active EMIS- අවස්ථා කිහිපයකදීම ක්‍රියාත්මක කිරීමට උත්සාහ ගන්න ලදි		
c) We have lost the reliability of EMIS developed by the Ministry and no expectations on its success		

11. Give your suggestions proposals to adopt the information system successfully -සාර්ථකව තොරතුරු පද්ධතියක් ක්‍රියාත්මක කිරීමට යෝජනා ඉදිරිපත් කරන්න

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APPENDIX C-INTERVIEW QUESTIONNAIRE

Identification of factors that affect the successful adoption of MIS in the Ministry of Education
(Senior Management -ජේෂ්ඨ කළමනාකරණ නිලධාරින්)

තනතුර Post: Add.Sec/SAS   අංශය

Division:...

1. ඔබ ආයතනයට තොරතුරු කළමනාකරණ ප්‍රතිපත්තියක් පවතීද. එසේ පවතීනම එය සමස්ත පද්ධතියම දැනුවත්ව ක්‍රියාත්මක වන්නක්ද? පවතින ගැටළු මොනවාද? Does your organization has an information management policy? If yes, is it operationalized and aware of all officers and what are the issues?

2. ඉහල කළමනාකරණය ලෙස ඔබට තොරතුරු පද්ධතියක් ක්‍රියාත්මක කිරීමට පවතින වගකීම කුමක්ද ? As a senior manager, what is your responsibility for the implementation of the information management system**?**

3. ඔබ ආයතනය විසින් කළමනාකරණයට, තොරතුරු කළමනාකරණ පද්ධති හදුන්වාදී තිබේද? Did your organization has introduced Management Information Systems for information management?
   a. ඒ මොනවද? ඒවායේ දැනට ක්‍රියාත්මක තත්වය කුමක්ද ? ඒවායේ ගැටළු මොනවාද? What are they? What are its functionality and problems?

4. එම තොරතුරු පද්ධති ක්‍රියාත්මක කිරීම සහ නිර්මාණයට ඔබගේ මැදිහත්වීම කෙබඳුද? What role do you have for the development and implementation of MIS?

5. ඔබ ආයතනයට තොරතුරු පද්ධතියක් අවශ්‍ය නම් එය සකස් කිරීමට සහ ක්‍රියාත්මක කිරීමට ඇති බාධාවන් මොනවද If you need MIS for your organization, what are the major barriers for development and Implementation of MIS

6. ඔබගේ ආයතන පරිසරය සහ පුද්ගලයන්ගෙන්, වෙනත් කරුණු මත තොරතුරු පද්ධතියක් ක්‍රියාත්මක කිරීමට බාධාවන් පවතිනමේ මොනවාද? Does your organization culture, people affect to implementation of Information systems?

7. තොරතුරු පද්ධතියක් ක්‍රියාත්මකත කිරීමට අවශ්‍ය ආයතනික පසුබිම සකස්වී ඇතිද? නැතිනම් එය කළ යුත්තේ කෙසේද? Is your organization ready for MIS implementation? If not how can you do that?

8. ඔබ සිතන පරිදි තොරතුරු පද්ධතියක් සාර්ථකව ක්‍රියාත්මක කිරීමට දැනට පවතින ගැටළු මොනවාද? According to your views what are the issues for the successful implementation of MIS

9. තොරතුරු පද්ධතියක් ක්‍රියාත්මක කිරීම අසාර්ථක වුයේ නම් එයට හේතු මොනවද? If MIS implementation is unsuccessful what are reasons for it?

10. සමස්ත ක්‍රියාවලියම තොරතුරු පද්ධතියක් සඳහා යොමුකළහොත් එය ක්‍රියාත්මක කිරීමට අවශ්‍ය සම්පත් සහ පහසුකම් පවතීද? එයට ඔබ ආයතනය සුදානම්ද? If MoE convert the whole process in to online, do you think you have the needed resources and could you evaluate the readiness of the organization

11. ඔබ, මීට පෙර සේවය කල ආයතනවල මෙවැනි තොරතුරු පද්ධතියක් ක්‍රියාත්මක කළේද? ඔබට භාවිත කර පලපුරුද්දක් පවතීද? ඒවා සාර්ථකද? Do you have any experience in using MIS in previous institutions that you have worked and how were they successful

12. දැනට අමාත්‍යංශ, පළාත්,කලාප මට්ටමෙන් අන්තර්ජාල පහසුකම් සහ වෙනත් පහසුකම් ඇද්ද? නැතිනම් පවතින ගැටළු මොනවාද? ඔවුන්ගේ සුදානම කෙබඳුද? Do MOE, Provinces and zones have internet facilities and other resources? If so how ready are them and what are their problems if they have any?

13. දැනට පවතින දත්ත කළමනාකරණය කරන ක්‍රමවේදය කුමක්ද පවතින ගැටළු මොනවාද? What is the current data management process that you are practicing day today?

14. තොරතුරු පද්ධතියක් ක්‍රියාත්මක කිරීමට ආයතනයේ ඉහළ නිලධාරීන්ගේ සහය, උනන්දුව, අවශ්‍ය සම්පත් මේ සඳහා ලබාගත හැකිද? Do you expect that you could get top management support and necessary resources for IS implementation?

15. තොරතුරු පද්ධතියක් සාර්ථකව ක්‍රියාත්මක කිරීමට ඔබගේ යෝජනා මොනවාද? Provide your suggestions to the implementation MIS successfully in the Ministry of Education

APPENDIX D-SUMMARY OF THE SURVEY DATA

SN	Gender	Designation	Education Qualification	POLICY	OC	M_PRO CESS	M_SU PPOR T	WOR_ ENVIR O	ORGE RNIZA TION	E_RE ADYN ESS	SYST EM_Q UALIT Y	INFO_ QUALI TY	SERVI CE_Q UALIT Y	TECHN OLOGY	COM_COM PITENCY	PEO_CH RACTER	PEOPLE
1	Male	Additional Provincial Director	Degree	4.60	5.50	5.40	6.00	5.71	5.44	4.60	3.50	3.50	2.50	3.53	3.67	4.78	4.22
2	Female	Additional Provincial Director	Degree	4.60	3.50	3.20	4.50	3.86	3.93	2.40	4.75	4.75	3.50	3.85	4.00	3.89	3.94
3	Male	Additional Provincial Director	Degree	4.40	5.17	4.60	5.25	4.86	4.85	5.20	4.00	3.50	3.33	4.01	4.67	4.67	4.67
4	Male	Additional Provincial Director	Degree	5.00	5.00	5.20	5.50	4.86	5.11	5.00	5.00	5.00	5.00	5.00	5.00	2.67	4.78	3.72
5	Male	Additional Provincial Director	Diploma	3.20	4.50	4.20	3.50	3.86	3.85	4.00	5.00	5.00	2.00	4.00	5.00	4.33	4.67
6	Male	Additional Provincial Director	Master	3.80	3.33	2.20	3.00	3.71	3.21	2.20	3.75	4.25	3.17	3.34	4.00	3.89	3.94
7	Female	Additional Provincial Director	Master	4.40	4.67	4.20	5.00	4.14	4.48	5.00	3.50	3.50	4.50	4.13	4.67	4.00	4.33
8	Male	Additional Provincial Director	Master	5.40	3.33	3.00	4.75	3.29	3.95	3.40	4.00	3.50	3.00	3.48	4.00	4.11	4.06
9	Male	Additional Provincial Director	Master	4.60	3.33	3.60	3.50	3.00	3.61	2.60	4.75	4.75	4.00	4.03	4.33	3.89	4.11
10	Female	Additional Zonal Director	Degree	4.60	3.17	2.40	4.00	4.57	3.75	5.20	2.00	2.00	3.33	3.13	5.00	4.22	4.61
11	Male	Assistant Director	Degree	4.40	4.33	2.80	4.25	4.29	4.01	4.80	4.50	3.50	4.33	4.28	5.00	4.33	4.67
12	Male	Assistant Director	Degree	5.80	5.00	4.00	4.50	4.14	4.69	5.40	5.50	4.00	5.00	4.98	5.00	4.33	4.67
13	Male	Assistant Director	Degree	2.40	3.67	2.40	4.00	3.29	3.15	3.80	3.00	2.00	3.50	3.08	5.00	3.67	4.33
14	Male	Assistant Director	Degree	5.00	3.33	3.40	4.25	3.14	3.83	4.60	3.75	3.25	3.17	3.69	4.33	4.11	4.22
15	Male	Assistant Director	Degree	4.80	4.67	3.60	4.50	3.86	4.28	3.40	3.00	3.00	2.00	2.85	3.00	3.78	3.39
16	Male	Assistant Director	Degree	3.00	2.33	3.20	2.25	3.86	2.93	3.80	4.00	2.00	4.00	3.45	4.67	4.00	4.33
17	Female	Assistant Director	Degree	5.00	4.67	3.40	4.75	4.71	4.51	5.00	4.75	5.00	5.00	4.94	5.00	4.11	4.56
18	Male	Assistant Director	Master	5.40	3.33	3.60	5.00	3.57	4.18	2.80	4.00	5.00	3.00	3.70	2.67	4.00	3.33
19	Female	Assistant Director	Master	4.80	4.50	4.40	5.25	4.57	4.70	3.60	4.75	4.50	4.17	4.25	5.00	4.33	4.67
20	Female	Assistant Director	Master	5.00	3.17	3.60	5.00	4.14	4.18	3.60	3.25	3.00	4.00	3.46	5.00	4.78	4.89
21	Male	Assistant Director	Master	4.60	5.50	4.80	4.00	3.71	4.52	5.00	4.00	5.00	4.00	4.50	4.67	4.67	4.67
22	Female	Assistant Director	Master	5.20	3.67	3.60	4.75	4.29	4.30	5.00	4.75	3.50	2.00	3.81	5.00	4.00	4.50

APPENDIX D-SUMMARY OF THE SURVEY DATA

SN	Gender	Designation	Education Qualification	POLICY	OC	M_PROCESS	M_SUPPORT	WOR_ENVIRO	ORGERNIZATION	E_READYNESS	SYSTEM_QUALITY	INFO_QUALITY	SERVICE_QUALITY	TECHNOLOGY	COM_COMPITENCY	PEO_CHRACTER	PEOPLE
23	Male	Assistant Director	Master	5.00	5.00	4.60	5.00	4.29	4.78	6.00	2.00	2.00	4.50	3.63	5.00	4.44	4.72
24	Female	Assistant Director	Degree	4.80	3.50	4.00	5.75	4.57	4.52	4.80	3.75	2.25	3.17	3.49	4.67	4.11	4.39
25	Male	Assistant Director	Degree	4.80	4.33	2.00	4.00	3.86	3.80	4.00	2.00	2.00	2.50	2.63	2.00	3.67	2.83
26	Male	Assistant Director	Degree	4.00	4.17	3.40	4.00	4.00	3.91	5.00	4.00	2.75	4.33	4.02	4.67	4.00	4.33
27	Male	Assistant Director	Degree	5.20	5.17	4.60	5.75	3.86	4.91	5.20	4.25	2.75	3.00	3.80	3.67	4.89	4.28
28	Male	Assistant Director	Degree	4.80	2.00	4.40	4.50	3.71	3.88	4.80	4.50	3.50	2.33	3.78	4.67	3.67	4.17
29	Male	Assistant Director	Degree	3.80	2.33	2.20	2.25	2.43	2.60	2.20	3.00	2.75	3.00	2.74	4.00	3.11	3.56
30	Male	Assistant Director	Degree	4.40	4.00	3.40	4.00	3.86	3.93	4.80	3.50	2.50	4.83	3.91	4.67	3.89	4.28
31	Female	Assistant Director	Degree	4.80	3.83	3.40	3.00	3.86	3.78	3.20	3.00	3.75	3.00	3.24	5.00	3.78	4.39
32	Male	Assistant Director	Degree	4.60	1.83	1.60	3.00	2.00	2.61	2.40	2.00	2.75	1.50	2.16	3.33	3.11	3.22
33	Female	Assistant Director	Master	4.80	3.17	3.00	4.75	4.29	4.00	4.60	2.00	2.00	4.67	3.32	5.00	4.22	4.61
34	Female	Assistant Director	Master	4.40	3.33	3.00	3.00	2.86	3.32	4.20	4.25	2.50	4.17	3.78	5.00	3.67	4.33
35	Female	Assistant Director	Master	4.60	2.00	2.00	2.00	2.71	2.66	2.00	1.00	2.00	2.33	1.83	4.33	4.44	4.39
36	Male	Assistant Director	Master	5.20	3.83	2.60	5.25	4.57	4.29	4.60	4.25	4.50	4.00	4.34	3.67	4.78	4.22
37	Male	Assistant Director	Master	3.00	3.17	3.00	3.25	2.71	3.03	3.40	2.00	2.00	3.17	2.64	4.33	3.22	3.78
38	Female	Deputy Director	Master	4.40	4.00	3.60	4.50	4.00	4.10	4.20	3.25	3.75	3.50	3.68	4.33	4.44	4.39
39	Male	Deputy Director	Master	5.00	4.33	3.60	4.50	4.29	4.34	4.80	2.00	1.25	2.00	2.51	4.67	3.89	4.28
40	Male	Deputy Director	Master	4.00	4.00	2.80	4.75	4.14	3.94	2.80	2.25	3.50	3.00	2.89	4.33	4.33	4.33
41	Female	Deputy Director	Master	4.20	3.67	2.60	3.50	3.29	3.45	2.80	2.00	2.25	2.33	2.35	4.00	4.22	4.11
42	Male	Deputy Director	Master	2.20	2.33	2.00	3.50	2.14	2.44	2.20	1.00	1.00	1.83	1.51	5.00		5.00
43	Male	Deputy Director	Master	3.20	2.00	2.00	3.25	2.43	2.58	2.80	2.50	2.25	2.83	2.60	5.00	4.44	4.72

APPENDIX D-SUMMARY OF THE SURVEY DATA

SN	Gender	Designation	Education Qualification	POLICY	OC	M_PROCESS	M_SUPPORT	WOR_ENVIRO	ORGERNIZATION	E_READYESS	SYSTEM_QUALITY	INFO_QUALITY	SERVICE_QUALITY	TECHNOLOGY	COM_COMPITENCY	PEO_CHRACTER	PEOPLE
44	Female	Deputy Director	Master	5.60	4.50	4.20	5.75	4.00	4.81	4.80	3.25	2.50	3.67	3.55	4.67	4.78	4.72
45	Female	Deputy Director	PGDM	4.20	3.83	3.60	3.75	3.14	3.71	3.60	2.00	2.00	2.17	2.44	2.00	4.56	3.28
46	Female	Deputy Director	PGDM	3.40	5.00	3.60	5.00	4.71	4.34	4.40	3.00	2.25	2.33	3.00	3.67	4.33	4.00
47	Female	Deputy Director	PGDM	4.20	3.67	3.40	4.25	3.43	3.79	3.00	2.00	2.50	2.67	2.54	3.67	3.56	3.61
48	Male	Deputy Director	Degree	4.60	4.50	4.80	5.25	4.57	4.74	4.40	6.00	5.50	3.83	4.93	5.00	5.11	5.06
49	Female	Deputy Director	Master	4.40	4.67	4.40	5.00	4.43	4.58	4.40	4.25	4.50	4.67	4.45	3.67	4.56	4.11
50	Male	Deputy Director	Master	4.80	4.00	4.40	4.75	4.43	4.48	3.80	2.25	3.50	3.33	3.22	4.00	4.44	4.22
51	Male	Deputy Director	Master	3.60	3.17	2.40	4.25	4.14	3.51	3.00	4.50	3.50	3.67	3.67	4.67	4.00	4.33
52	Female	Deputy Director	Master	4.40	2.67	2.60	3.75	3.29	3.34	3.00	2.25	2.00	2.00	2.31	3.67	4.11	3.89
53	Male	Deputy Director	Degree	4.20	4.17	3.00	4.50	4.14	4.00	3.80	2.00	2.00	1.83	2.41	2.00	4.33	3.17
54	Female	Deputy Director	Degree	4.20	3.50	3.00	4.75	3.57	3.80	3.40	2.00	2.00	2.17	2.39	4.00	4.00	4.00
55	Female	Deputy Director	Degree	4.20	3.83	4.60	5.00	3.71	4.27	4.20	4.75	4.25	2.17	3.84	4.00	4.11	4.06
56	Female	Deputy Director	Degree	4.80	3.50	4.20	5.50	4.43	4.49	4.80	3.00	2.25	4.33	3.60	4.67	3.89	4.28
57	Female	Deputy Director	Degree	3.20	3.17	2.60	3.50	2.71	3.04	2.80	2.00	2.00	2.00	2.20	4.00	4.22	4.11
58	Male	Deputy Director	Degree	4.00	3.00	2.60	5.00	3.00	3.52	2.40	2.75	3.00	3.00	2.79	4.67	4.67	4.67
59	Female	Deputy Director	Degree	4.80	5.00	4.20	5.25	4.57	4.76	3.00	2.25	2.25	3.17	2.67	1.00	4.33	2.67
60	Female	Deputy Director	Degree	5.00	4.67	3.40	4.00	4.71	4.36	4.20	2.00	2.00	2.00	2.55	5.00	4.11	4.56
61	Female	Deputy Director	Degree	4.40	3.50	3.40	4.50	3.86	3.93	2.40	3.00	3.00	2.83	2.81	4.00	3.89	3.94
62	Female	Deputy Director	Degree	4.00	3.67	3.60	4.25	3.43	3.79	3.00	2.00	2.25	2.50	2.44	3.67	3.44	3.56
63	Male	Deputy Director	Degree	4.60	4.83	1.80	4.50	4.14	3.98	2.00	1.00	1.00	1.50	1.38	5.00	4.89	4.94
64	Female	Deputy Director	Degree	4.00	4.00	3.40	4.25	3.43	3.82	3.40	3.00	3.00	2.67	3.02	3.67	3.33	3.50

APPENDIX D-SUMMARY OF THE SURVEY DATA

SN	Gender	Designation	Education Qualification	POLICY	OC	M_PROCESS	M_SUPPORT	WOR_ENVIRO	ORGERNIZATION	E_READYNESS	SYSTEM_QUALITY	INFO_QUALITY	SERVICE_QUALITY	TECHNOLOGY	COM_COMPITENCY	PEO_CHRACTER	PEOPLE
65	Male	Deputy Director	Degree	4.20	3.83	3.60	3.75	3.43	3.76	4.00	3.50	3.75	2.50	3.44	4.67	4.33	4.50
66	Female	Deputy Director	Degree	4.40	2.67	3.20	4.50	2.71	3.50	2.40	2.50	2.25	2.50	2.41	3.67	3.22	3.44
67	Female	Deputy Director	Degree	5.00	3.50	2.40	4.00	3.57	3.69	4.00	2.25	2.00	1.83	2.52	3.67	4.44	4.06
68	Male	Deputy Director	Degree	5.00	4.67	4.80	4.25	4.29	4.60	2.80	2.25	1.00	1.33	1.85	4.67	3.89	4.28
69	Male	Deputy Director	Master	4.40	3.33	2.00	2.75	3.71	3.24	2.20	3.00	3.00	3.00	2.80	4.00	4.56	4.28
70	Female	Deputy Director	Master	4.40	3.67	3.80	4.00	3.00	3.77	2.60	4.25	2.50	4.33	3.42	4.00	4.22	4.11
71	Female	Deputy Director	Master	4.80	3.67	4.20	4.50	3.43	4.12	3.00	3.50	2.50	2.33	2.83	5.00	4.78	4.89
72	Female	Deputy Director	Master	4.40	3.50	3.00	4.75	3.86	3.90	3.00	2.00	2.00	2.50	2.38	2.33	4.11	3.22
73	Male	Deputy Director	Master	4.80	2.83	3.20	4.75	3.14	3.75	1.60	2.00	2.00	2.00	1.90	2.67	5.11	3.89
74	Male	Deputy Director	Master	4.60	3.00	3.20	4.00	4.00	3.76	1.60	3.25	4.25	2.83	2.98	5.00	3.67	4.33
75	Female	Deputy Director	Master	4.20	3.67	3.60	3.50	3.43	3.68	3.00	3.00	3.00	2.67	2.92	3.67	3.44	3.56
76	Male	Deputy Director	Master	4.60	4.00	4.20	4.50	4.71	4.40	4.40	3.50	2.50	3.33	3.43	5.00	4.44	4.72
77	Female	Deputy Director	Master	4.60	2.83	3.20	4.50	3.00	3.63	3.20	2.00	2.00	2.00	2.30	4.00	3.67	3.83
78	Female	Deputy Director	Master	4.20	2.67	3.20	3.50	3.29	3.37	3.00	2.25	2.00	2.00	2.31	3.67	4.22	3.94
79	Male	Deputy Director	Master	4.80	3.83	4.20	4.75	3.86	4.29	4.00	2.00	2.00	2.67	2.67	4.67	4.22	4.44
80	Female	Deputy Director	Master	4.60	2.00	2.00	2.00	2.57	2.63	2.00	2.00	2.00	2.67	2.17	4.33	4.11	4.22
81	Female	Deputy Director	Master	4.40	4.67	4.40	5.00	4.57	4.61	5.00	4.00	4.00	4.50	4.38	4.67	4.33	4.50
82	Female	Deputy Director	Master	4.40	3.50	3.40	4.75	4.14	4.04	5.00	3.75	3.00	2.00	3.44	5.00	4.44	4.72
83	Female	Deputy Director	Master	4.80	3.83	4.20	4.50	4.57	4.38	3.60	4.75	4.00	4.17	4.13	5.00	4.33	4.67
84	Male	Deputy Director	PGDM	5.20	4.50	4.40	5.50	4.00	4.72	3.80	3.25	2.75	3.67	3.37	4.67	4.56	4.61
85	Female	Director	Degree	4.80	4.83	4.60	5.50	4.57	4.86	5.00	5.00	5.00	4.83	4.96	4.00	4.44	4.22

APPENDIX D-SUMMARY OF THE SURVEY DATA

SN	Gender	Designation	Education Qualification	POLICY	OC	M_PROCESS	M_SUPPORT	WOR_ENVIRO	ORGERNIZATION	E_READYNESS	SYSTEM_QUALITY	INFO_QUALITY	SERVICE_QUALITY	TECHNOLOGY	COM_COMPITENCY	PEO_CHRACTER	PEOPLE
86	Female	Director	Degree	4.00	3.17	4.60	4.50	3.57	3.97	4.40	2.00	2.00	2.17	2.64	4.00	4.33	4.17
87	Female	Director	Degree	4.40	4.67	3.60	5.00	3.00	4.13	4.40	4.00	3.75	4.00	4.04	4.33	4.78	4.56
88	Male	Director	Degree	4.00	4.00	2.40	3.00	4.29	3.54	3.80	4.75	4.00	3.83	4.10	5.00	4.00	4.50
89	Female	Director	Degree	4.80	2.33	2.60	3.75	2.71	3.24	3.60	4.00	4.00	3.33	3.73	4.67	4.11	4.39
90	Male	Director	Degree	2.80	2.17	1.80	1.75	2.14	2.13	2.40	1.75	1.50	1.50	1.79	4.33	2.78	3.56
91	Female	Director	Degree	4.60	3.83	3.40	4.25	3.57	3.93	3.40	2.00	3.00	3.33	2.93	5.00	3.33	4.17
92	Male	Director	Degree	4.80	3.17	2.20	4.00	3.00	3.43	3.60	1.50	2.25	2.50	2.46	5.00	4.11	4.56
93	Female	Director	Degree	4.80	5.00	4.40	5.00	4.14	4.67	4.20	4.25	4.00	4.17	4.15	4.00	4.22	4.11
94	Male	Director	Degree	5.20	3.33	3.60	5.00	3.29	4.08	3.00	2.75	1.50	3.00	2.56	4.00	4.11	4.06
95	Male	Director	Degree	5.40	5.50	4.60	5.50	5.00	5.20	4.80	5.25	5.00	4.67	4.93	5.00	5.22	5.11
96	Female	Director	Degree	4.60	3.33	2.80	4.25	2.43	3.48	4.20	2.00	3.75	2.83	3.20	5.00	3.44	4.22
97	Female	Director	Degree	3.60	4.50	3.80	4.75	4.43	4.22	3.60	4.75	4.00	4.00	4.09	5.00	4.89	4.94
98	Female	Director	Degree	4.20	3.83	2.40	3.00	3.86	3.46	4.00	4.75	4.00	4.00	4.19	5.00	4.11	4.56
99	Female	Director	Degree	4.00	4.83	4.00	4.25	4.43	4.30	4.40	4.00	4.00	5.00	4.35	5.00	3.22	4.11
100	Female	Director	Degree	4.80	3.83	2.20	4.25	3.57	3.73	2.80	3.75	3.25	3.33	3.28	4.00	3.56	3.78
101	Male	Director	Degree	3.60	4.50	4.20	5.25	4.71	4.45	5.00	4.75	5.75	5.17	5.17	5.00	4.78	4.89
102	Female	Director	Master	4.00	4.17	3.40	4.75	3.14	3.89	4.00	4.00	4.00	3.67	3.92	4.67	3.78	4.22
103	Male	Director	Master	4.20	3.17	2.00	1.75	2.86	2.79	1.00	1.50	1.00	1.50	1.25	4.67	4.22	4.44
104	Male	Director	Master	5.20	4.50	4.20	5.75	4.00	4.73	4.80	3.25	2.75	3.67	3.62	4.67	4.78	4.72
105	Male	Director	Master	4.60	3.33	3.40	4.25	3.43	3.80	3.20	3.50	3.25	3.83	3.45	4.67	4.00	4.33
106	Female	Director	Master	4.20	2.17	2.00	2.75	2.86	2.79	3.20	2.00	2.00	2.33	2.38	3.33	4.11	3.72

SN	Gender	Designation	Education Qualification	POLICY	OC	M_PROCESS	M_SUPPORT	WOR_ENVIRO	ORGE RNIZA TION	E_RE ADYNESS	SYST EM_Q UALITY	INFO_QUALITY	SERVICE_Q UALITY	TECHN OLOGY	COM_COM PITENCY	PEO_CH RACTER	PEOPLE
107	Male	Director	Master	5.20	3.17	2.20	5.50	5.43	4.30	5.40	4.75	4.75	5.00	4.98	5.00	4.33	4.67
108	Female	Director	Master	5.40	3.33	4.00	4.50	3.71	4.19	3.20	5.25	3.25	4.00	3.93	4.67	3.56	4.11
109	Male	Director	Master	5.20	4.33	3.60	3.25	4.14	4.11	3.00	1.00	1.00	1.00	1.50	4.00	3.89	3.94
110	Female	Director	Master	5.60	4.67	4.40	4.50	4.43	4.72	5.00	5.00	2.00	5.00	4.25	4.00	5.00	4.50
111	Female	Director	Master	4.40	4.17	4.40	5.00	4.14	4.42	4.20	4.00	5.00	4.17	4.34	4.33	4.00	4.17
112	Female	Director	Master	5.00	3.50	3.20	5.50	4.43	4.33	5.00	2.00	3.00	3.33	3.33	5.00	4.67	4.83
113	Female	Director	Master	3.40	3.17	3.80	4.00	3.86	3.64	4.40	2.00	2.00	2.33	2.68	4.67	4.22	4.44
114	Male	Director	Master	4.20	3.83	4.20	3.00	3.43	3.73	4.40	2.00	2.00	2.17	2.64	3.33	3.56	3.44
115	Female	Director	Master	5.40	4.67	4.40	4.50	3.43	4.48	5.40	3.50	4.00	4.17	4.27	5.00	4.44	4.72
116	Male	Director	Master	4.40	3.00	3.20	3.75	3.71	3.61	2.80	3.50	2.75	5.00	3.51	4.00	4.67	4.33
117	Male	Director	Master	3.80	3.50	4.40	4.50	4.43	4.13	3.40	4.00	4.00	4.00	3.85	3.00	3.89	3.44
118	Male	Director	Master	4.60	3.67	3.60	5.50	3.86	4.24	3.80	4.00	4.00	4.00	3.95	3.00	4.00	3.50
119	Female	Director	Master	3.60	6.00	4.00	4.00	3.43	4.21	2.20	2.25	2.25	2.33	2.26	3.33	4.78	4.06
120	Male	Director	Master	4.60	3.83	4.40	4.50	4.29	4.32	3.80	3.00	2.00	3.00	2.95	2.67	3.89	3.28
121	Male	Director	Master	5.20	4.00	4.00	5.00	4.57	4.55	4.40	3.00	3.00	2.50	3.23	3.67	4.22	3.94
122	Male	Director	Master	4.40	2.33	2.40	6.00	4.00	3.83	3.20	2.75	1.75	2.00	2.43	4.67	3.22	3.94
123	Female	Director	Master	4.60	4.33	2.80	4.50	5.43	4.33	5.00	2.25	2.00	1.17	2.60	5.00	5.00	5.00
124	Female	Director	Master	4.60	4.17	2.80	5.25	5.14	4.39	3.40	2.00	1.25	1.33	2.00	5.00	5.56	5.28
125	Female	Director	PGDM	4.40	4.83	4.40	5.00	4.29	4.58	4.20	2.25	2.25	2.17	2.72	4.67	3.56	4.11
126	Female	Director	PGDM	4.40	3.00	2.80	4.00	4.14	3.67	2.80	1.50	1.00	1.67	1.74	4.00	3.56	3.78
127	Male	Director	Degree	4.60	4.33	3.80	4.25	4.00	4.20	4.80	4.25	3.75	4.00	4.20	4.67	3.89	4.28

APPENDIX D-SUMMARY OF THE SURVEY DATA

SN	Gender	Designation	Education Qualification	POLICY	OC	M_PROCESS	M_SUPPORT	WOR_ENVIRO	ORGERNIZATION	E_READYNESS	SYSTEM_QUALITY	INFO_QUALITY	SERVICE_QUALITY	TECHNOLOGY	COM_COMPITENCY	PEO_CHRACTER	PEOPLE
128	Male	Director	Master	4.00	4.00	3.60	4.25	3.43	3.86	3.00	2.00	2.00	3.00	2.50	2.33	3.44	2.89
129	Male	Director	Master	4.20	3.83	4.20	4.75	3.71	4.14	4.20	1.50	1.50	1.17	2.09	3.33	3.78	3.56
130	Male	Director	Master	5.80	2.67	3.20	4.75	4.00	4.08	3.80	2.00	1.00	2.00	2.20	4.00	4.11	4.06
131	Male	Director	Master	4.60	5.00	3.20	4.50	4.57	4.37	3.00	3.75	4.50	4.17	3.85	5.00	4.33	4.67
132	Male	Director	Master	5.80	5.17	4.80	4.25	4.86	4.97	5.40	2.00	2.00	2.00	2.85	3.67	3.78	3.72
133	Male	Director	Master	5.40	5.83	4.00	4.75	4.43	4.88	4.60	2.00	1.50	2.33	2.61	5.00	4.89	4.94
134	Male	Director	Master	4.80	4.33	3.80	3.75	4.29	4.19	5.00	4.75	4.75	4.67	4.79	2.33	3.78	3.06
135	Male	Director	PGDM	4.40	4.33	4.40	4.75	3.71	4.32	4.60	2.00	2.00	2.00	2.65	4.67	4.56	4.61
136	Female	Director	Degree	3.40	4.67	3.00	4.25	2.86	3.63	4.20	4.00	1.75	3.50	3.36	2.67	3.67	3.17
137	Male	Director	Degree	3.80	5.33	4.40	6.00	5.29	4.96	6.00	5.00	5.00	5.50	5.38	3.00	4.78	3.89
138	Male	Director	Degree	4.20	4.17	3.80	5.50	4.71	4.48	4.60	2.00	2.00	3.33	2.98	3.67	5.00	4.33
139	Male	Director	Degree	4.60	4.83	3.00	4.25	4.29	4.19	4.60	4.00	3.00	2.00	3.40	2.00	4.67	3.33
140	Male	Director	Degree	5.20	4.33	4.80	5.50	4.86	4.94	4.80	2.75	2.50	3.83	3.47	3.67	4.89	4.28
141	Male	Director	Degree	5.00	2.50	2.00	3.50	2.71	3.14	2.00	2.00	2.00	2.50	2.13	2.00	3.67	2.83
142	Male	Director	Degree	3.00	2.00	1.80	3.00	2.14	2.39	3.00	2.00	2.00	2.00	2.25	4.67	3.33	4.00
143	Female	Director	Degree	5.00	4.33	3.20	5.00	4.43	4.39	3.40	3.25	3.00	2.83	3.12	1.00	4.44	2.72
144	Male	Director	Degree	5.20	4.50	3.60	5.00	4.43	4.55	3.80	2.50	2.75	3.67	3.18	4.67	4.11	4.39
145	Male	Director	Degree	5.20	4.33	3.60	5.25	4.43	4.56	3.80	3.00	2.75	3.33	3.22	4.67	4.22	4.44
146	Female	Director	Degree	5.20	2.83	4.40	3.50	3.86	3.96	3.00	5.75	6.00	2.17	4.23	3.67	3.78	3.72
147	Female	Director	Degree	4.80	4.83	4.00	5.50	5.00	4.83	4.80	3.50	2.75	3.17	3.55	5.00	4.56	4.78
148	Male	Director	Degree	4.40	4.83	2.20	4.25	4.14	3.97	2.00	1.00	1.00	1.67	1.42	5.00	4.44	4.72

APPENDIX D-SUMMARY OF THE SURVEY DATA

SN	Gender	Designation	Education Qualification	POLICY	OC	M_PROCESS	M_SUPPORT	WOR_ENVIRO	ORGE RNIZATION	E_READYNESS	SYSTEM_QUALITY	INFO_QUALITY	SERVICE_QUALITY	TECHNOLOGY	COM_COMPITENCY	PEO_CHRACTER	PEOPLE
149	Female	Director	Degree	5.00	5.00	2.40	4.25	4.71	4.27	2.60	1.00	1.00	2.00	1.65	5.00	4.44	4.72
150	Male	Director	Degree	4.40	4.17	4.20	4.75	3.14	4.13	4.60	2.00	2.00	2.00	2.65	4.67	4.56	4.61
151	Male	Director	Degree	4.80	4.00	3.60	4.75	4.29	4.29	4.00	3.25	3.00	2.00	3.06	1.33	4.44	2.89
152	Male	Director	Degree	5.00	3.83	2.40	5.00	3.86	4.02	4.40	2.50	2.00	2.33	2.81	3.33	3.89	3.61
153	Female	Director	Degree	3.60	2.33	2.00	2.75	4.14	2.97	2.00	2.00	2.00	2.00	2.00	3.67	4.89	4.28
154	Male	Director	Degree	5.60	5.33	2.80	4.75	4.14	4.53	5.00	2.25	2.00	2.33	2.90	4.00	4.89	4.44
155	Male	Director	Degree	4.80	4.17	3.80	3.75	3.71	4.05	4.00	3.25	2.50	2.67	3.10	3.67	4.00	3.83
156	Female	Director	Degree	4.40	3.83	2.20	3.75	3.00	3.44	3.80	2.00	2.25	2.33	2.60	3.67	3.67	3.67
157	Male	Director	Degree	4.80	4.33	4.40	4.50	3.86	4.38	3.60	3.00	3.00	2.00	2.90	3.00	3.44	3.22
158	Male	Director	Degree	5.00	3.17	3.40	4.50	4.57	4.13	2.20	1.00	1.00	1.00	1.30	4.00	3.78	3.89
159	Female	Director	Degree	4.60	3.83	3.20	2.50	3.43	3.51	3.60	2.00	1.25	1.83	2.17	3.67	4.33	4.00
160	Male	Director	Degree	4.80	4.17	3.80	3.75	3.57	4.02	4.00	2.75	2.00	2.17	2.73	3.67	4.00	3.83
161	Male	Director	Degree	5.60	5.50	4.60	5.75	4.86	5.26	5.20	2.00	2.00	2.17	2.84	1.67	5.44	3.56
162	Female	Director	Degree	4.20	3.00	3.00	4.50	2.71	3.48	1.80	1.00	2.00	1.67	1.62	3.67	3.22	3.44
163	Female	Director	Degree	3.60	2.33	1.80	2.75	4.14	2.93	2.00	2.00	2.00	1.83	1.96	3.67	4.89	4.28
164	Female	Director	Master	4.40	3.17	3.20	3.75	2.86	3.47	3.20	3.50	4.00	3.83	3.63	5.00	3.44	4.22
165	Male	Director	Master	3.60	4.33	4.40	5.25	4.14	4.35	3.00	2.50	2.50	2.17	2.54	2.33	4.22	3.28
166	Male	Director	Master	3.80	4.67	4.20	5.75	5.43	4.77	3.20	2.75	2.00	2.00	2.49	5.00	4.00	4.50
167	Female	Director	Master	5.40	4.17	5.20	5.75	4.29	4.96	5.60	2.25	1.75	2.83	3.11	5.00	4.89	4.94
168	Male	Director	Master	4.60	4.50	2.40	4.75	4.29	4.11	4.40	2.75	2.00	2.33	2.87	3.33	4.00	3.67
169	Male	Director	Master	4.40	4.00	3.40	4.75	4.14	4.14	3.80	2.25	2.00	2.33	2.60	2.33	3.78	3.06

APPENDIX D-SUMMARY OF THE SURVEY DATA

SN	Gender	Designation	Education Qualification	POLICY	OC	M_PROCESS	M_SUPPORT	WOR_ENVIRO	ORGERNIZATION	E_READYNESS	SYSTEM_QUALITY	INFO_QUALITY	SERVICE_QUALITY	TECHNOLOGY	COM_COMPITENCY	PEO_CHRACTER	PEOPLE
170	Female	Director	Master	4.60	3.83	3.40	4.75	4.00	4.12	3.60	2.00	1.50	2.00	2.28	3.67	4.22	3.94
171	Female	Director	Master	4.40	3.50	4.40	4.75	4.43	4.30	3.40	3.75	3.00	3.83	3.50	3.33	3.89	3.61
172	Female	Director	Master	5.20	4.50	4.20	4.50	4.57	4.59	3.60	3.00	2.50	2.50	2.90	2.67	3.89	3.28
173	Male	Director	Master	4.60	4.33	4.40	4.75	4.00	4.42	4.80	1.00	1.75	2.33	2.47	4.67	3.67	4.17
174	Female	Director	Master	5.00	4.50	4.40	5.75	4.00	4.73	4.80	2.50	2.75	2.83	3.22	4.67	4.44	4.56
175	Male	Director	Master	4.40	3.83	4.40	4.75	4.43	4.36	3.40	3.25	3.00	3.83	3.37	3.33	3.89	3.61
176	Female	Director	Master	5.60	5.50	4.60	5.75	5.29	5.35	5.20	2.00	2.25	2.50	2.99	1.67	5.44	3.56
177	Male	Director	Master	5.40	4.83	4.60	5.00	6.00	5.17	3.20	4.25	2.50	2.33	3.07	1.00	4.44	2.72
178	Female	Director	Master	5.00	4.00	3.40	5.00	4.14	4.31	3.60	2.25	2.25	3.33	2.86	4.67	4.00	4.33
179	Male	Director	Master	5.00	4.00	4.00	5.00	5.43	4.69	2.60	3.00	2.50	2.83	2.73	4.00	3.56	3.78
180	Female	Director	Master	5.60	5.00	3.00	4.75	4.57	4.58	2.80	2.50	2.00	2.00	2.33	3.00	4.78	3.89
181	Male	Director	PGDM	5.60	3.50	2.20	4.00	2.57	3.57	3.20	4.75	3.00	3.50	3.61	2.33	4.33	3.33
182	Female	Director	PGDM	4.20	3.83	3.80	4.75	3.86	4.09	3.80	3.50	2.00	2.00	2.83	3.33	4.56	3.94
183	Male	Director	PGDM	5.20	4.83	4.60	4.00	4.71	4.67	2.20	2.25	2.00	2.17	2.15	3.67	4.22	3.94
184	Male	Director	PGDM	6.00	4.67	5.20	5.25	4.14	5.05	2.40	3.00	4.00	3.33	3.18	2.33	4.67	3.50
185	Female	Director	PGDM	5.20	4.00	3.40	5.00	4.14	4.35	3.40	3.75	3.25	2.83	3.31	4.00	3.56	3.78
186	Male	Director	PGDM	4.60	4.17	3.60	6.00	5.57	4.79	4.40	3.00	2.25	2.17	2.95	2.67	4.78	3.72