The University of Dhaka

The Effects of Implementing Enterprise Resource Planning Systems on Accounting Information: Bangladesh Perspective

A Dissertation submitted to

The Faculty of Business Studies

in Candidacy for the Degree of

Doctor of Philosophy

Department of Accounting & Information Systems

By

James Bakul Sarkar

Under the supervision of

Prof. Dr. Swapan Kumar Bala FCMA

Dhaka, Bangladesh

Declaration

I declare that the dissertation titled "**The Effects of Implementing Enterprise Resource Planning Systems on Accounting Information: Bangladesh Perspective"** embodies the results of my own research work pursued under the supervision of Professor Dr. Swapan Kumar Bala FCMA, Department of Accounting & Information Systems, University of Dhaka, Bangladesh.

I further affirm that the research work presented in this dissertation is original and it has not been submitted earlier either partly or fully to any other University or Institution for any Degree, Diploma or any other purpose.

_____

James Bakul Sarkar

Ph.D Registration No. 26/2010-11
Department of Accounting & Information Systems
University of Dhaka

CERTIFICATE

This is to certify that the dissertation titled "**The Effects of Implementing Enterprise Resource Planning Systems on Accounting Information: Bangladesh Perspective"** has been prepared by **James Bakul Sarkar** under my supervision. The entire dissertation comprises the candidate's own work and personal achievement.

It is an original piece of research work and has not been submitted to any other University or Institution for Ph.D. Degree or for any other purpose. I recommend the dissertation for evaluation for awarding the degree of Doctor of Philosophy in Accounting &Information Systems under the Faculty of Business Studies, University of Dhaka.

Prof. Dr. Swapan Kumar Bala FCMA

Department of Accounting & Information Systems

University of Dhaka

Dhaka

Acknowledgments

It is a great privilege to undergo the Ph.D program in the Department of Accounting &Information Systems under the Faculty of Business Studies, University of Dhaka. I would like to show my gratitude to the Chairman of the Departmental Ph.D Committee Prof. Dr. Shafiq Ahmed Siddique for his suggestions and cooperation for the completion of my Ph.Ddissertation. I also thank my direct teacher Prof. Md. Abdul Hakim, Chairman, Department of Accounting & Information Systems, who has continuously inspired me to pursue my research work. I am especially thankful tothe United International University authority for granting me study leave and for all other supports.

I especially thankMr. Muhammad Hasan Al-Mamun, Assistant Professor, United International University for his continuous help and suggestions particularly with respect to processing of data through SPSS. Without his valuable contribution, I can never complete my research work.

I express my gratitude to Prof. Dr. Hasnan Ahmed for his continuous inspiration throughout the endeavor. I would like to give thanks to Dr. Mohammad Badrudozza Mia for his valuable suggestions.

I like to convey my gratitude to the persons and authors whose articles, books, journals and research works I have consulted and duly cited in my dissertation. I express my indebtedness to those individuals, institutions and associations who contributed directly or indirectly to the completion of my research work by providing exactly the kind of assistance and encouragement I needed.

I especially thank Mr. Abdul HannanZoarder, Executive Director, Bangladesh Securities and Exchange Commission (BSEC) to let me use the library of BSEC. I give sincere thanks to the officials of different listed companies for extending their help while collecting the annual reports and for the purpose of this study, developing the survey-based list of companies which implemented ERP (Enterprise Resource Planning). Messrs.Samiul Aziz, Md. Salam Morshadi, and Mufti MejbaurRahman deserve special thanks for helping me prepare the initial survey-based list and assimilating and organizing the data in MS Excel. I like to show my gratefulness

tothe professional accountants who extended their cordial support during the survey I conducted. Mr. Abhijit Kumar SahaACA of Bangladesh Rating Agency Limiteddeserves special thanks.

I would like to give thanks to Dr. Soheluzzaman and Dr. Salma Karim, my colleagues at the United International University,for extending their valuable suggestions.

I convey my sincere thanks to Mrs. AlhamraParvin Luna, Administrative Officer, Department of Accounting & Information Systems, Dhaka University, for her sincere cooperation in organizingrequired seminars for thePh.Dstudents.

Finally, I am extremely indebted to my spouse and children. Without their sacrifice and support, I could not accomplish my research work. I would like to especially thank my students who acted as a continuing source of my inspiration.

James BakulSarkar

Abstract

The use of Information Technology (IT) including Enterprise Resource Planning (ERP) in the corporate arena is increasing all over the world during the last few decades. Bangladesh is no exception to this. ERP is in use in the most of the giant and multi-national companies in Bangladesh. Many of the benefits of ERP are yet to be explored by the managers in Bangladesh. Moreover, implementing such ERP-enabled software is expensive and time-consuming. This study ultimately has shed light on the issue–How ERP implementations in corporate sectorsaffect decision usefulness of accounting information in the context of Bangladesh. Decision usefulness of accounting information depends on the fundamental qualities of accounting information.

Two fundamental qualities of accounting information, i.e., faithful representation and relevance (predictive and feedback values) along with the enhancing qualitative characteristics including verifiability and timeliness have been focused in the study.

The study is exploratory and the researcher's survey-based list of ERP-adopting firms has been treated as a sampling frame. Since the ready-made sampling frame of the ERP-adopting firms is not available, a survey has been undertaken through telephone-interview using the phone numbers mentioned in the address-database of the listed entities published by the Dhaka Stock Exchange (DSE) in their monthly publications and available in the DSE's website. During July-December 2011, the researcher contacted all the listed firms (enlisted with DSE up to December 2010) through telephone calls and found 65 firms that are ERP-enabled. Out of 65 ERP-enabled firms, 37 firms have adopted ERP partially. The remaining 28 firms have adopted full version of ERP. Since December 2011, out of these 28 firms, the number of non-financial firms that have adopted full modules of ERP was 14.The researcher applied purposive sampling technique. Finally, 7 firms were selected as the sample unit. These 7 firms were all non-financial ERP-adopters. The researcher has also taken 7 other non-ERP firms as "control" with a view to comparing the effects of ERP implementation on accounting information across ERP-adopting and non-adopting firms.For applying statistical tools, data on selected variables have been taken for a period of 16 years from 1995-96 to 2010-11 in case of financial year or from 1996 to 2011 in case of calendar year. Thus the sample size for data on selected variables for 7 ERP-adopting firms is 104 firm-years and that for 7 control firms (ERP non-adopting firms) is 77 firm-years.

As shown above in the table, due to non-availability of data, the sample size for some variables is reduced (which is minimum 85 for ERP-adopting firms, and 69 for control firms).

The present study was conducted on the non-financial firms enlisted with DSE as on December 2011 that adopted ERP-based software. The study used both primary and secondary data. The secondary data have been collected from the published annual reports of different listed companies (enlisted with DSE). The primary data have been collected through sending a close-ended structured questionnaire through e-mail.The questionnaire covered six qualitative characteristics of accounting information through 25 statements for measuring through 5-point Likert scale. The collected data were analyzed using different statistical tools like descriptive statistics (mean, standard deviation, percentage of frequency distribution etc.), standard multiple regressions, coefficient of determination, chi-square test, auto regression, independent sample t-test, one way sample t-test and ANOVA. The data were processed in micro computer using Statistical Packages for Social Sciences (SPSS).

The findings of the study indicate that ERP implementations in the respective firms decrease faithful representation,which supported the existing literature. The findings of the study further reveal that ERP usage increases relevance with respect to feedback value of accounting information. It is also found that ERP usage increases relevance with respect to predictive value. But it is observed that ERP usage does not increase timeliness of reporting. The reporting lag between the ERP –adopting firms and the non-adopting firms are mathematically significant but statistically not significant.

Three significant findings merit attention. Firstly, ERP implementation does not affect faithful representation (modified Jones model) whereas faithfulness of the accounting information is declined on ERP adoption as per extended modified Jones model supporting the finding of the opinion survey and the existing literature.

Secondly, it is evident from the study that ERP implementations encourage earnings management.

Thirdly, ERP implementation increases relevance with respect to predictive value and feedback value but not with respect to timeliness. The reporting lag is not significantly declined on ERP implementation.

CONTENTS

List of Tables

List of Figures

Abbreviations

ABC	Activity Based Costing
AICPA	American Institute of Certified Public Accountants
AIS	Accounting Information System
APB	Accounting Principles Board
ASOBAT	A Statement of Basic Accounting Theory
BoB	Best of breed
BPR	Business Process Reengineering
BSEC	Bangladesh Securities and Exchange Commission
CAS	Computer Assurance Specialist
CEO	Chief Executive Officer
CIO	Chief Information Officer
CRM	Customer Relationship Management
CSF	Critical Success Factors
DSE	Dhaka Stock Exchange
EDI	Electronic Data Interchange
EOQ	Economic Order Quantity
ERC	Earnings Response Coefficients
ERP	Enterprise Resource Planning
ERP II	Extended ERP
ES	Enterprise Systems
FASB	Financial Accounting Standards Board
FIFO	First-in, first-out
HR	Human Resources
IAS	International Accounting Standards

IASB	International Accounting Standards Board
ICANZ	Institute of Chartered Accountants of Australia and New Zealand
ICMW	Internal Control Material Weakness
IEMC	International Enterprise Modeling Conference
IFRS	International Financial Reporting Standards
IMA	Institute of Management Accountants
IT	Information Technology
MRP	Materials Requirement Planning
MRP II	Manufacturing Resources Planning
Par	Paragraph
QC	Qualitative Characteristics
ROA	Return on Assets
SAP	Systems, Applications and Products
SCM	Supply Chain Management
SFAC	Statement of Financial Accounting Concepts
SOX	Sarbanes-Oxley Act (2002)
XML	Extensible Markup Language
Y2K	Year 2000

Chapter 1

INTRODUTION

INTRODUCTION

1.1 Overview of Chapter

The first chapter, chapter one, discusses the background of the study in the first instance. It also explains the research problem followed by development of the hypotheses. The objectives and the rationale of the study are also discussed. Finally this chapter includes an organization of the Study.

1.2 Background of the Study

Nowadays Enterprise Resource Planning System (ERP) plays a vital role in the business environment. On the other hand, the quality of accounting information is a critical issue for the decision makers. Accounting aims, as an information system, to provide various users with different forms of useful information to meet their various needs. Therefore, accounting seeks to take advantage of the surrounding circumstances in order to improve the quality and quantity of information and the delivery mechanisms to users. As many software companies produce Enterprise Resource Planning, such systems have spread globally and locally here in Bangladesh. Following to the transformation of the companies to the use of computerized accounting systems which become a part of ERP system, it became inevitable to recognize such systems and their performance on business and accounting as well. On the other hand, although there are some organizations that prefer to develop their own programs, either by themselves or through professionals, giant organizations including multi-national companies (MNC) recently have started adopting the use of comprehensive business solution, the heart of which is accounting. This is known as ERP, which is characterized by providing integrated incompatible results to the departments and assist them to improve the quality of their decisions and the preparation of comprehensive integrated plans (Brehm and Gomez, 2010).

The commonality in the previous research is the crucial role accounting information plays in an ERP enabled environment. For ERP system adopters, the system is responsible for generating the accounting information such as financial statements which are used to measure ERP system implementation success, provide external users with financial information, and determine operational performance. While ERP system adoptions may

affect firm performance that is described by financial statements, whether these systems affect the decision usefulness of the accounting information is unknown. FASB (1978, 2) states that "financial reporting should provide information that is useful to present and potential investors and creditors and other users in making rational investment, credit, and similar decisions." Thus, a logical extension of extant research is to investigate how ERP system implementations affect the primary purpose of financial accounting information, decision usefulness, through its fundamental qualitative characteristics, namely, faithful representation and relevance and enhancing qualitative characteristics, namely, timeliness and verifiability. If ERP systems represent a radical change from the legacy systems of the past and accounting information is a product of the ERP system, it is likely that the fundamental and enhancing qualitative characteristics that affect decision usefulness should be impacted by ERP systems implementation.

This study examines how the adoption of Enterprise Resource Planning (ERP) systems affects the decision usefulness of financial accounting information in terms of two significant fundamental qualities, namely, faithful representation and relevance. Specifically, the study investigates whether ERP implementations result in increased information relevancy in terms of predictive value and feedback value and decreased information faithful representation (previously named as reliability) for external users of accounting information. Faithful representation (i.e., reliability) and relevance are two primary qualities determining the decision usefulness of accounting information (FASB, 1980). The FASB (1980) defines relevance as "the capacity of information to make a difference in a decision by helping users form predictions about outcomes of past, present, and future events or to conform or correct prior expectations" and reliability as "the quality of information that assures that information is reasonably free from error and bias and faithfully represents what it purports to represent." ERP systems are defined as "information systems packages that integrate information and information-based processes within and across functional areas in an organization" (Kumar and Hillegersberg, 2000, 22). The ERP systems have changed the way accounting information is processed, analyzed, audited and communicated. The implementation and utilization of ERP systems represents a radical change from the legacy systems of the past as business functions are integrally linked through workflow automation and one

authoritative database. The potential advantages of ERP systems (e.g., assisting business process reengineering, reducing complications with Sarbanes- Oxley Act compliance) have made them the system of choice among many corporations (O'Leary, 2000; Winters, 2004). By 1999, 70 percent of Fortune 1000 firms had either adopted or were in the process of implementing ERP systems (Cerullo and Cerullo, 2000). Prior accounting research confirms these positive expectations as ERP adoption announcements have given rise to positive market responses and ERP implementations have led to improved operational performance (e.g., Hayes et al., 2001; Hunton et al., 2003). ERP systems are expected to collect and disseminate timely information to managers and thus improving their ability to process and analyze accounting information (Davenport, 1998; Hitt et al., 2002). Moreover, these integrated systems eliminate barriers between firm functions, allowing managers unprecedented access to accounting information (O'Leary, 2000). The findings of this study may be of significant interests to preparers (management) of financial statements initially adopting ERP systems or wishing to adopt ERP systems, changing ERP suppliers, or adopting the next version of ERP system. Regulators overseeing the public markets and reviewing recent consolidation in the ERP system industry might be interested that ERP system adoption could result in more faithful and more relevant financial statements for external users. The implementation of ERP systems may enhance the reliance and confidence of the users (both internal and external) on the published financial statements. Finally, this study provides authenticators (auditors) with empirical data to give a comfort that ERP systems implementation can potentially increase the faithfulness of the financial statements.

1.3 Research Problem

The intention of this research is to ascertain whether ERP implementation positively or negatively affect decision usefulness of accounting information with particular reference to faithful representation, relevance including feedback and predictive value, verifiability and timeliness and if decision usefulness is affected, whether ERP implementation results in less faithful but yet more relevant financial information for the external users. At the same time, the research aims at examining whether managers induce to manage earnings on ERP implementation.

1.4 Objectives of the Study

The study is conducted with a view to:

a) Most significantly, examining whether ERP implementation helps managers manage earnings or not.
b) Exploring the relationships between ERP implementation and accounting information faithful representation (previously known as reliability).
c) Exploring the relationships between ERP implementation and accounting information relevance with respect to predictive value, and feedback value.
d) Examining the effects of ERP implementations on the decision usefulness of accounting information that are presented to the external users. The effect on the decision usefulness of accounting information has been examined with respect to faithful representation and relevance–two fundamental qualities of accounting information. The effect has also been examined with respect to enhancing qualitative characteristics including verifiability and timeliness.
e) Critically seeing to what extent ERP implementations are economically feasible from decision usefulness of information in the corporate sectors in the context of Bangladesh.
f) Finally examining whether ERP experience and professional experience of the auditors have any bearing on the responses made by them as to the effects of ERP implementation on faithful representation, relevance, verifiability and timeliness of accounting information.

1.5 Rationale of the Study

The study is significant from different dimensions. First, prior studies analyzed the effects of ERP implementations on the usefulness of accounting information, taking into account a single component each from reliability and relevance. This study aims at analyzing faithful representation, relevance and enhancing qualitative characteristics to determine the effects of ERP implementations on the usefulness of accounting information. This would be indeed a valuable addition to the existing body of knowledge. Moreover, no study has yet been conducted in Bangladesh in this field. This study will

also unveil the potential benefits of ERP implementations in context of Bangladesh. This is also important to know whether ERP adoptions are really feasible in context of Bangladesh as the implementation of ERP is expensive. Moreover, the study seems to be important to the academicians and accounting practitioners as this focuses the effects of implementing ERP on qualitative characteristics of useful financial information that are developed in the recent time (IASB, 2010).

1.6 Organization of the Study

The structure of the remaining chapters of this dissertation is as follows: Chapter two focuses on the relevant conceptual issues of enterprise resource planning (ERP). Chapter three discusses the usefulness of accounting information. Then chapter four reviews the applicable academic literature in the area. This is undertaken in order to construct the theory required to understand and assess the research hypothesis. Chapter five discusses the methodology of this research including the measuring instrument, variables, sampling, data collection and processing. Chapter six discusses the empirical results along with relevant interpretations and finally focuses on the findings of the study. Finally chapter seven summarizes and concludes the research and outlines possible future research directions.

1.7 Definition of Important Terms

Different concepts have been used in this study. Few important terms have been defined as follows:

ABC Costing:

Activity-based costing (ABC) refines a costing system by identifying individual activities as the fundamental cost objects. An activity is an event, task, or unit of work with a specified purpose-for example, designing products, setting up machines, operating machines, and distributing products. More informally, activities are verbs; they are things that a firm does. Consistent with their more strategic focus, ABC systems identify activities in all functions of the value chain. ABC systems first calculate the costs of individual activities and then assign costs to cost objects such as products and services on

the basis of the mix of activities needed to produce each product or service (Cooper and Kaplan, 1999).

Accounting:

Accounting is a service activity. Its function is to provide quantitative information primarily financial in nature about economic entities that is intended to be useful in making economic decisions, in making resolved choices among alternative courses of actions (Belkaoui, 2000).

Audit:

Audit is the systematic process of obtaining and evaluating evidence regarding assertions about economic actions and events in order to determine how well they correspond with established criteria (Romney and Steinbart, 2003).

Comparability:

Information that has been measured and reported in a similar manner for different enterprises is to be treated as comparable. The users compare between similar information of different enterprises and have practical ideas about the similarities and the differences of information (IASB, 2010c).

Conceptual Framework:

A conceptual framework is a constitution, a coherent system of interrelated objectives and fundamentals that can lead to consistent standards and that prescribes the nature, function and limits of financial accounting and financial statements (FASB, 1980).

Confirmatory Value:

Financial information has confirmatory value if it provides feedback about (confirms or changes) previous evaluations. The predictive value and confirmatory value of financial information are interrelated. Information that has predictive value often also has confirmatory value (IASB, 2010c).

Consistency:

As per paragraphs 45-46 of IAS 1 *Presentation of Financial Statements*, consistency is related to presentation. To be consistent, the presentation and classification of items in the financial statements are usually retained from one period to the next. Comparative information of prior periods is disclosed for all amounts reported in the financial statements, unless an IFRS (International Financial Reporting Standard) requires or permits otherwise (IASB, 2010a, A300).

Customer Relationship Management (CRM):

Customer relationship management (CRM) encompasses the principles, practices, and guidelines that an organization follows when interacting with its customers. From the organization's point of view, this entire relationship not only encompasses the direct interaction aspect, such as sales and/or service related processes, but also in the forecasting and analysis of customer trends and behaviors, which ultimately serve to enhance the customer's overall experience (Monk and Wagner, 2009).

Earnings Management:

Ronen and Yaari (2008) have given a comprehensive definition of earnings management as follows:

> Earnings management is a collection of managerial decisions that result in not reporting the true short-term, value-maximizing earnings as known to management. Earnings management can be:
>
> Beneficial: it signals long-term value;
> Pernicious: it conceals short- or long-term value;
> Neutral: it reveals the short-term true performance.
>
> The managed earnings result from taking production/investment actions before earnings are realized, or making accounting choices that affect the earnings numbers and their interpretation after the true earnings are realized (Ronen and Yaari, 2008, 27).

Enterprise Resource Planning (ERP):

Enterprise resource system is a way to integrate the data and processes of an organization into one single system. Usually ERP systems will have many components including hardware and software, in order to achieve integration. Most ERP systems use unified database to store data for various functions found throughout the organization (Monk and Wagner, 2009).

ERP II:

"ERP II" refers to a second-generation system with additional features such as supply chain management and customer relationship management was introduced in the market (Monk and Wagner, 2009).

Feedback value:

This is also known as confirmatory value.

Information:

Information is data that have been organized and processed to provide meaning and improve the decision-making process (Romney and Steinbart, 2003).

Internal Control:

Internal control means the whole system of controls, financial and otherwise, established by management in order to carry on the business of an enterprise in an orderly and efficient manner, ensure adherence to management policies, safeguard the assets, and secure as far as possible the completeness and accuracy of the records (Parker, 1992).

MRP (Materials Requirement Planning):

This is called usual MRP or "material requirements planning", which refers to a system of computer simulations that also answers additional questions such as what, how many, and when inventory items are needed. After projections for sales and production, the

model generates a time-sequenced schedule for inventory purchases (Monk and Wagner, 2009).

MRP II (Manufacturing Resource Planning):

Manufacturing resource planning (MRP II) is defined as a fully integrated system that plans production jobs using the usual MRP method, and also calculates resource needs such as labor and machine hours in addition to inventory (Monk and Wagner, 2009). Material requirements planning (MRP) and manufacturing resource planning (MRP II) are predecessors of enterprise resource planning (ERP).

Neutrality:

A neutral depiction is without bias in the selection or presentation of financial information. A neutral depiction is not slanted, weighted, emphasized, de-emphasized or otherwise manipulated to increase the probability that financial information will be received favorably or unfavorably by users. Neutral information does not mean information with no purpose or no influence on behavior (IASB, 2010c).

Predictive value:

Financial information has predictive value if it can be used as an input to processes employed by users to predict future outcomes. Financial information need not be a prediction or forecast to have predictive value. Financial information with predictive value is employed by users in making their own predictions (IASB, 2010c).

Relevance:

Accounting information is relevant to the extent that it is useful and meaningful to the users. It can affect users' decision. To be relevant, accounting information must be capable of making a difference in a decision by helping users form predictions about the outcomes of past, present, and future events or to conform or correct prior expectations (IASB, 2010c).

Reliability:

Reliability is one of primary qualities of information that assures that information is reasonably free from error and bias and faithfully represents what it purports to represent. To be reliable, information must be verifiable, neutral and faithfully presented. Thus, the reliability of information depends on its degree of faithfulness in the representation of an event. Accounting information is reliable to the extent that users can depend upon the information in a decision (IASB, 2010c).

Representational Faithfulness:

Financial reports represent economic phenomena in words and numbers. To be useful, financial information must not only represent relevant phenomena, but it must also faithfully represent the phenomena that it purports to represent. To be a perfectly faithful representation, a depiction would have three characteristics. It would be complete, neutral and free from error (IASB, 2010c).

Supply Chain Management (SCM):

Supply chain management refers to management of materials and information flow in a supply chain to provide the highest degree of customer satisfaction at the lowest possible cost (Monk and Wagner, 2009).

Timeliness:

Timeliness means having information available to decision-makers in time to be capable of influencing their decisions. Generally, the older the information is the less useful it is. However, some information may continue to be timely long after the end of a reporting period because, for example, some users may need to identify and assess trends (IASB, 2010c).

Verifiability:

Verifiability helps assure users that information faithfully represents the economic phenomena it purports to represent. Verifiability means that different knowledgeable

and independent observers could reach consensus, although not necessarily complete agreement, that a particular depiction is a faithful representation. Quantified information need not be a single point estimate to be verifiable. A range of possible amounts and the related probabilities can also be verified (IASB, 2010c).

Y2K Problem:

Y2K is a bug that can cause computers or software to misinterpret the first two digits of the year 2000 as 19, due to the coding of dates using only the last two digits of the year. In the late 1990s, the year 2000, or Y2K, problem motivated many companies to move to ERP systems. As it became clear that the date turnover from December 31, 1999 to January1, 2000 would wreak havoc on some information systems, companies searched for ways to consolidate data, and ERP systems provided one solution. The Y2K problem originated from programming shortcuts made by programmers in the preceding decades (Monk and Wagner, 2009).

Chapter 2

ENTERPRISE RESOURCE PLANNING (ERP): RELEVANT CONCEPTUAL ISSUES

ENTERPRISE RESOURCE PLANNING (ERP): RELEVANT CONCEPTUAL ISSUES

2.1 Introduction

An ERP is an information system that optimizes and integrates all the enterprise functions. It provides services to all the functional areas in the organization. It provides the enterprise with the capacity to plan and manage its resources based on an integrated approach (Turban, Mclean, and Wetherbe, 2003, Sanchez and Bernal, 2007, 294). Some authors in the Information Systems (IS) field also call these systems Enterprise Information Systems (Davenport, 1998; Turban, Mclean, and Wetherbe, 2003; Sanchez & Bernal, 2007, 294). The ERP is an industry-driven concepts and systems and is universally accepted by the industry as a practical solution to achieve integrated enterprise information systems (Moon, 2007, 235). Billah et al. (2008, 17) states that the enterprise resource system is a software package that integrates all the information flowing through a company. Guffond and Leconte (2004, 61) define the ERP system from different angles as follows:

- The ERP system is a tool assembling and integrating all data and management skills which represent the firm's activity, in a unique database: from finance to human resources, going through the elements of the supply chain that permanently links the production to purchasing and sales.
- The ERP system is a tool conceptually situated between standard and singularity, between open and close, and having two layers. The "generic layer" attends to respond to the needs of all or several firms according to referred and experienced solutions known to be better practices and corresponding to standard rules of management. The "specific layer" is a multiuser layer and therefore personalized. It has to take into account the particular characteristics of the organization by means of lengthy study to see how the firm must adopt.
- The ERP system is a tool composed of applicative modules (one per ordinary analytical function of the firm) able to dialog between each other according to a conventional exchange protocol thanks to the unique base and the uniqueness of

the processed data. Then each module receives information coming from the other modules and sends its own data to the other modules.

- Lastly, the ERP system is a tool that the managerial literature presents as a tool able to control the firm in real-time, using a transversal perspective; it is then pulled up to a level considered as a change vector, in view of reaching a new era of industrial rationalization.

2.2 Evolution and Growth of the System

ERP has its roots in manufacturing and material requirement planning which has been continually applied to new context i.e. financial services, public sector, healthcare and now, higher education (Pollock and Cornford, 2004, 31-52). From Umble et al. (2003, 242-244) it is clear that this evolution occurs in four stages. First, in the 1960s companies can afford to carry relatively large amounts of inventory, but they use traditional techniques such as economic order quantity (EOQ) to minimize costs. Second, companies in the 1970s can no longer afford much inventory. This leads to materials requirement planning (MRP) systems, which are computer simulations that also answers additional questions such as what, how many, and when inventory items are needed. After projections for sales and production, the model generates a time-sequenced schedule for inventory purchases. In the third stage, increased power and affordability of information technology (IT) lead to improvements to MRP in the 1980s, which results in Manufacturing Resource Planning or MRP II. This fully integrated system plans production jobs using the usual MRP method, and also calculates resource needs such as labor and machine hours in addition to inventory. Finally in the fourth stage, there is continuing developments in IT sectors which allow MRP II to be expanded to incorporate resource planning for the entire enterprise. This is how, the term, enterprise resource planning (ERP) is coined to include and integrate different functional units such as product design, materials planning, capacity planning, communication systems, human resources, finance, and project management. At that time, ERP systems are offered to non-manufacturing companies as well. The scope offered by an ERP system expands in mid 1990s to Enterprise systems implementation and accounting benefits, which include functions such as order management, financial management, warehousing, distribution

production, quality control, asset management and human resource management (Fisher, 2006, 1-229). The first generation ERP system (introduced by vendors such as SAP and Baan) was used by large manufacturing companies such as Boeing, Mercedes-Benz and BMW (Kumar and Hillersberg, 2000, 23-6). Over time, various other industries such as retail, wholesale and service also began using ERP system (Markus et al., 2000, 42-46). In recent years, ERP II – a second generation system with additional features such as supply chain management and customer relationship management was introduced in the market. The improved ERP system (ERP II) integrates back and front end office operations seamlessly (Beath, 2000, 355-72). The primary backbone of ERP system is information technology (IT) which helps in the integration of numerous applications and processes owned by different departments in a firm. It is not just about enabling efficient communication between networks and protocols but is also about integration of different business processes, company policies and organizational structures (Kumar and Hillersberg, 2000, 23-6).The evolution of ERP system is diagrammatically shown in the following table:

Table 2.1: Evolution period of ERP

Period	Evolution
2000s	Extended ERP System (ERP II)
1990s	Enterprise Resource Planning (ERP)
1980s	Manufacturing Resource Planning (MRP II)
1970s	Material Requirements Planning (MRP)
1960s	Inventory Control Packages

Source: Adapted from Huang et al. (2003, 137-145)

Since mid 1990s, the number of ERP using firms has been growing significantly. Caldwell and Stein (1998) report that ERP system has become a part and parcel of firms with over $1 billion annual turnover in the year 1998. Six years later, Markus et al. (2000) highlight that nearly 70% of Fortune 1000 firms are users of ERP system. Huang and Palvia (2001, 276-284) account global ERP licensing revenue reaching $ 21.5 billion in the year 2000. In another instance, Kumar and Hillersberg (2000, 23-6) estimate global

ERP sales of $ 20 billion by the year 2005. This massive investment in ERP depicts business firms' preference for ERP system.

In the late 1990s, the year 2000, or Y2K, problem motivated many companies to move to ERP systems. As it became clear that the date turnover from December 31, 1999 to January 1, 2000 would wreak havoc on some information systems, Companies searched for ways to consolidate data, and ERP systems provided one solution (Monk and Wagner, 2009). That is why, many companies were faced with a choice: pay programmers millions of dollars to correct the Y2K problem in their old, limited software or invest in an ERP system that would not only solve the Y2K problem, but potentially provide better management of their business processes as well. Thus, the Y2K problem led to a revolutionary change in business for ERP vendors in the late 1990s.

2.3 Implementation of ERP Systems

Due to the large ERP system's capabilities and the essential solutions expected from this system to support the enterprise, its implementation process is complex and risky. It engages a considerable amount of enterprise resources, which are put at risk during implementation (Sanchez and Bernal, 2007, 293-309). Moreover, its implementation is costly and time consuming. The decision to implement an ERP system represents a significant investment of firm resources. ERP Systems, sold by vendors such as SAP AG and Oracle Corporation, on average, cost $ 15 million and implementations take, on average, 21 months to complete (O'Leary, 2000; Brazel and Dang, 2008, 1-21). Recent studies still address the problem of choice of an adequate ERP system (Wei et al. 2005, 47-62; Verville and Halingten, 2003, 585-594). This point is also considered by Kumar et al., 2003, 793-807. New methods are also suggested fro tracing critical implementation steps, like Somers and Nelson (2003, 315-338) use a probabilistic description to identify which activities associate with the various steps of the ERP implementation are important. For the authors, some key aspects like training, communication or role of the steering committee are not yet fully taken into account during the whole lifecycle of the implementation. The most suitable implementation process according to the characteristics of a company is the central idea of several articles: for example, Mabert et

al. (2003, 235-246) argue, on the basis of case studies in the US, that the implementation method should depend on the size of the company or Wu and Wang (2007) focus on the industry size and industrial sector to compare their difference in implementation. Berchet and Habchi (2005, 588-605) with the help of an industrial case study based on Alcatel, describes the ERP project life cycle or implementation steps as a five-stage model: *selection of the vendor* and *software*, *deployment* and *integration*, *stabilization*, *progression*, and *evolution*. The main steps under *deployment* and *integration of the ERP system* are general design; detailed design, realization, and prototype validation; implementation of the solution; starting preparation; user training, and operational starting with production. According to Cooper and Zmud (1990), the implementation process consists of six phases: initiation, adoption, adaptation, acceptance, routinization, and infusion. Each of these steps should be monitored carefully for the successful implementation of the ERP system at the firm.

The alignment of the standard ERP processes with the company's business processes is considered as a critical step of the implementation process and holds the attention of many researchers. Chiplunkar et al (2003) suggest the capture of complete business environment in a business process reengineering (BPR) project with the help of information technology. Daneva (2003) also defines the reuse measurements. He defines the problem of process alignment in terms of composition and reconciliation: a general set of business processes and data requirements is established and then standard ERP functionalities are explored to see how closely it matches the entity's process and data needs. Luo and Strong (2004) observe the alignment in terms of customization of the standard ERP processes, while an elicitation-based method is suggested by Kato et al. (2003) for comparing user requirements to existing packages.

2.4 Impact of ERP on Organization

ERP use has a great impact on the transformation of any organization (Holland and Light, 1999) and especially on control, permitting a centralized view from top corporate on each entity, or allowing controlling a matrix structure through real-time information (Quattrone and Hopper, 2004). Studies confirm that the introduction of business practices

and new organizational practices are highly correlated with labor productivity (Falk, 2005). Contribution of ERP use to enterprise performance is now recognized. Results indicate that return on assets, return on investment, and asset turnover are significantly better over a 3-year period for adopters, as compared to non-adopters (Hunton et. al., 2003) even if the benefits differ by company size, or according to two organizational characteristics: interdependences and differentiation among a global organization (Gattiker and Goodhue, 2004). Critical for firm success, some companies choose to disclose ERP in their annual report. That choice is significantly associated with capital market transactions, firm performance, firm size, and industry (Mauldin and Richtermeyer, 2004). ERP systems are the major managerial tool and technology that requires the multi-disciplinary attention of operations management, information systems, finance, marketing, organizational behavior, and human resources fields (Sarkis and Sundarraj, 2003). That's why, it affects the organization. The organization very often has to change its total process or partially change the process to match the ERP system. Otherwise, it may not reap the benefits of ERP systems. To match the ERP with organization's business processes, companies have to appropriately customize both the system and/or the organization.

2.5 ERP Usefulness

Information technologies cannot by itself influence the productivity of a company. The main efficiency factor lies in the way people use these technologies. Many information strategies fail for ignoring this issue (Genoulaz et al., 2005, 510-522). ERP systems have become the most important IT solution, very much required by an enterprise in order to function as a well-integrated and coordinated business unit, supported by a unique IT structure (Sanchez and Bernal, 2007, 293-309). Many authors in the IS field have researched and written papers in the ERP systems domain that explained their important characteristic of integrating information, departments, functions, and processes throughout the entire enterprise (Klaus, Rosemann, and Gable, 2000,141-157; Parr and Shanks, 2000,1-10; Somers and Nelson, 2001, 315-338; Zhang et al., 2002, 1-10). As well as the potential advantages of ERP systems (e.g., assisting business process

reengineering, reducing complications with Sarbanes-Oxley Act compliance) have made them the system of choice among many corporations (O'Leary, 2000; Bradford and Roberts, 2001, 30-34; Winters, 2004, 34-40). By 1999, 70% of Fortune 1000 firms had either adopted or were in the process of implementing ERP systems (Cerullo and Cerullo, 2000, 25-34). Prior accounting research confirms these positive expectations as ERP adoption announcements have emerged positive market responses and ERP implementations have led to improved operational performance (e.g., Hayes et al., 2001, 3-18; Hunton et al. 2002,31-40). According to Deloitte Consulting (1998), the most important attributes of ERP software include its ability to: automatic and integrate the majority of an organization's business processes; share common data and practices across the entire enterprise; and produce and access information in a real-time environment.

The following quotation from Deloitte Consulting (1998, 19) now six years old, illustrates the sort of claim still typically made about informational benefits of ERP:

> As we have pointed out, one of the greatest benefits of an enterprise system is that it helps provide an immediate and accurate picture of virtually every business process in company-from customer information, to sales data, to inventory counts. Companies can use this data to their competitive advantage. They can share it with suppliers-automatically prompting purchase orders for raw materials when inventories run low. Data warehousing technology can manipulate raw data to help profile new customer segments – to turn data into customer knowledge.

Supramaniam and Kuppusamy (2010, 35-48) in a comprehensive study in context of Malaysia observe that the key benefits of ERP implementation can be derived from three perspectives which are operational efficiency, operational effectiveness and operational flexibility.

Monk and Wagner (2009) put forth the following benefits of ERP:

- ERP allows global integration: Barriers of currency exchange rates, language, and culture can be bridged automatically, so data can be integrated across international borders.
- ERP integrates people and data while eliminating the need to update and repair many separate computer systems. For example, Boeing had 450 data systems that fed data into its production process. The company now has a single way to record production data.

- ERP allows management to manage operations, not just monitor them. For example, without ERP, getting an answer to "How are we doing?" requires getting data from each business unit and then analyzing that data for a comprehensive, integrated picture. The ERP system already has all the data allowing the manager to focus on improving processes. This focus enhances management of the company as a whole, and makes the organization more adaptable when change is required.

2.6 Achievement of Competitive Advantage through ERP

One of the major objectives of ERP implementation is to achieve competitive advantage. Unfortunately, this is a controversial issue in the academic community. As evidenced in literature, Beard and Samner (2004, 129-150) argue that it is due to the "common systems" approach used for the implementation of most ERP systems. They state that this goal can be achieved with a careful planning and successful management of ERP projects, refinement of the reengineering of the organization, and the post-implementation alignment of the ERP system with the organization's strategic direction. Yen and Sheu (2004, 207-220) from a study of five manufacturing firms, investigate the relationship between ERP implementation practices and a firm's competitive strategy, and conclude that ERP implementation should be aligned with competitive strategy, proposing specific guidelines. (Hunton et al., 2003, 165-184) examine the longitudinal impact of ERP adoption on firm performance by matching firms that had adopted ERP with firms that had not. Their results indicate that return on assets, return on investment, and asset turnover are significantly better over a 3-year period for adopters. They shed light on the productivity paradox associated with ERP systems and suggest that ERP adoption helps firms gain a competitive advantage over non-adopters. To reconcile this paradox, Lengnick-Hall et al. (2004, 307-330) propose to consider ERP as enabling technology to build and augment social and intellectual capital, rather than as an information technology solution for organizational inefficiencies, and to use ERP as a foundation for social and intellectual capital formation.

The basic vendor argument is that ERP software will assist client firms to achieve superior profitability by a) enabling them to run more efficient or effective processes, and b) providing them with more detailed, accurate, relevant, integrated or faster information, thereby enabling them to respond to market conditions more quickly and effectively than their competitors (Seddon, 2005, 283-293). Thus Packaged enterprise application software (PEAS) vendors claim that ERP systems are a source of competitive advantage as competitive advantage is the source of a firm's 'superior profitability' (Porter, 1979, 2-10 ;1996, 70). Despite claims from vendors that PEAS can be a source of competitive advantage, the empirical studies of benefits from PEAS, particularly ERP, rarely mention that the software is a source of competitive advantage (Davenport et al., 2002, 26; Yang and Seddon, 2004). This is consistent with Nicholas Carr's (2003, 2004) view that IT has become a commodity, and therefore, that investments in IT are unlikely to be sources of competitive advantage. The reason ERP systems are an unlikely to be sources of competitive advantage is that, as Porter (1985, 150) has argued, competitive advantage comes from providing a unique value proposition for some group of customers. 'Competitive strategy is about being different' (Porter, 1996, 64). It is not clear that the ERP systems enable the enterprise to offer value propositions to their customers that differ significantly from their rivals.

When first published in the May-June issue of *Harvard Business Review*, 2003, Carr's argument that IT was unlikely to be a source of competitive advantage provoked a deluge of protesting Letters to the Editor. Chief Information Officers (CIOs) in large organizations around the world were alarmed because Carr's arguments challenged the key argument they used to justify their IT budgets. IT industry leaders took strong, if predictable, positions opposing Carr: 'Hogwash', said Steve Ballmer, CEO Microsoft, and 'dead wrong' said Carly Fiorina, then Hewlett-Packard (Carr, 2004). Varian (2004), a respected Berkeley economist, concluded 'It is not information technology itself that matters, but how you use it'. Applying Carr's argument to ERP, one might argue that ERP systems have now been widely available for over a decade, so that the firms most likely to be able to benefit most from the increased integration, information transparency and process efficiency enabled by such systems have had ample time to implement ERP

systems and adjust their work practices (Seddon, 2005). Thus, the potential competitive advantages from ERP (if they ever existed) are most likely to have already been competed away. Therefore, ERP is an unlikely source of competitive advantage in organizations today.

2.7 Motivation for ERP Implementation

In practice, it can be difficult to classify software as an ERP system or a non-ERP system (Beheshti, 2006, 184-93). The author uses the word of integration of functional areas of business as a criterion for this classification (Xenakis, 1999; galani et al., 2010, 418-23). Generally, the word integration is closely connected with enterprise applications. It is considered that integration is a way of making applications work together by passing information through some form of interface Gulledge (2006, 5-20). The integration of applications is one of the main reasons for the ERP adoption (Spathis and Constantinides, 2004, 234-47). However, ERP systems have not solved the integration problems as many companies do not give up their legacy systems and they integrate their functionality from disparate applications. ERP systems are not a solution for a business but can enhance the need for integration (Themistocleous et al., 2001, 195-204). There are several factors that are potentially influencing an organization's decision to implement the ERP systems. According to recent surveys, the reasons motivating organizations to adopt ERP systems are technical and business reasons (Velcu, 2007, 1316-34; Markus and Tanis, 2000, 173-207; Chand et al., 2005, 558-72). Markus and Tanis (2000, 173-207) identify various reasons that motivate a company to implement ERP systems classifying them into two categories: Technical reasons and Business reasons. They also suggest that there should be a relation between the reasons for adoption to the perceived benefits of ERP, by analyzing financial and non-financial benefits. According to Velcu's (2007, 1316-34) survey, for Finish companies, the most frequent motivation for ERP implementation is to replace the old legacy system, the Y2K problem, the need for a new integrated system, and the ease of upgrading to new versions, the need for a common financial strategy and vision throughout the organization, or the need to have a common system with a newly acquired company. Another survey for Greek companies indicated that the three most

popular reasons for adopting ERP systems are increased demand for real-time information, information for decision making and integration of applications (Poulymenakou and Borotis, 2005, 559). Raymond et al. (2005) examined initial motives in the adoption of ERP in e-government, classifying them into four categories: a) technological motivations (have to do with infrastructure), b) operational motivations (concern the improvement of processes), c) performance motivations (are contingent on the will to improve results) and d) strategic motivations (are linked to a change in orientation in the design and delivery of services. According to the results, drivers behind the decision to adopt ERP are technological motivations (search for integration of IT) and performance motivations (lower maintenance and operational costs).

2.8 Difficulties and Complexities of ERP Systems

Enterprise systems (ES) are complex application software packages that contain mechanisms supporting the management of the whole enterprise and integrate all areas of its functioning (Soja, 2008, 31-51). They promise the seamless integration of all the information flowing through a company - financial and accounting information, human resource information, supply chain information, and customer information (Davenport, 1998, 121). ERP starts to offer solutions in an attempt to seamlessly link front-office (e.g., sales, marketing, and customer services) and back offices (e.g., operations, logistics, financials, human resources) applications to enhance competitive advantages (Chen, 2001, 374-386). Prior studies examining difficulties in ERP projects can be classified into two groups-one group that categorizes the difficulties (O'Leary, 2000; Kim et al., 2005, 158-170) and another group that do not (Kremers and Dissel, 2000, 53-56; Umble and Umble, 2002, 25-33; Wright and Wright, 2002, 99-113). The identified groups cover categories of various nature and scope, e.g., technical, operational, legal, business/economic, organizational, managerial etc. Of late, Soja (2008, 31-51) categorize the difficulties of ERP implementation into the categories: economic, technical, organizational, and social. Soja (2008, 31-51) identify five most important difficulties in his findings: employees' knowledge and education, top management, high costs, project goals, and implementation team. These are very often reported by the Polish experts

while implementing the ERP projects. According to Little and Best (2003), the threats of ERP can come from internal or external intruders attempting to access sensitive information, modify data , enter fraudulent changes to programs, enter fraudulent transactions, and commit other undesirable acts within the system. They can be categorized into five main methods, namely:

a) passive techniques, such as wiretapping, electromagnetic pickup, concealed transmitters, and electronic eavesdropping;
b) attempted break-ins or password guessing;
c) masquerading, such as logging in with the target user's password and username, tapping into the line between the authorized user's workstation that has been left logged on to the network;
d) browsing, whereby authorized users attempt to access unauthorized functions or sensitive data; and
e) viruses and worms, which are programs that invade systems and are used to gain access to the data, to destroy or manipulate data and applications, or simply to use resources such as storage, memory, and processor time.

2.9 Critical Success Factors (CSF) for ERP Adoption

In the ERP context, Holland and Light (1999, 30-36) define critical success factors as "the factors needed to ensure a successful ERP project." Key factors of success or failures during implementation have been widely studied (Nah et al., 2001, 285-97; Huang et al., 2003, 137-145; Finney and Corbett, 2007, 329-47; Davenport, 1998, 121-31; Sarker and Lee, 2003, 813-29; Nah and Delgado, 2006, 99-113 etc.). Sarker and Lee (2003, 813-29) consider three success factors as relevant: strong and committed leadership, open and honest communication, balanced and empowered implementation team. Nah et al. (2001, 285-97) investigate CSF for ERP implementation by conducting a literature review, They find that key organizational issues are teamwork, change, management, top management support, plan and vision, business process management and development, project management, monitoring, effective communication, software development and testing, the role of the project champion and appropriate business and

IT legacy systems. Davenport (1998, 121-31) reports, in many cases, companies install the system without thinking through the full business implications. Managers who have initially viewed it as a silver bullet or as a quick fix of their problem or as a means of keeping pace with a competitor that has already implemented an ERP may have found it lacking and not as effective as they had hoped. This is why, a balance between standardization and flexibility based on careful determination of industrial and organizational demand and ensuring a balancing implementation approach is also an important factor to be considered (Al-Mashari, 2002, 165-70). Finney and Corbett (2007, 329-47) identify 26 possible success factors for ERP implementation, which are very closely related to the position in Bangladesh (Billah et al., 2008, 17). These factors are given in the following table:

Table 2.2: Success Factor for ERP Implementation

1. Top management commitment and support
2. Balanced team
3. Visioning and planning
4. Project team: the best and brightest
5. Build a business case
6. Communication plan
7. Project champion
8. Empowered decision makers
9. Implementation strategy and timeframe
10. Team morale and motivation
11. Vanilla ERP
12. Project cost planning and management
13. Project management
14. BPR and software configuration
15. Change management
16. Legacy system consideration
17. Managing cultural change
18. IT infrastructure
19. Client consultation
20. Selection of ERP
21. Consultant selection and relationship
22. Training and job redesign
23. Troubleshooting/crises management
24. Data conversion and integrity
25. System testing
26. Post-implementation evaluation

Source: Finney and Corbett (2007)

Supramaniam and Kuppusamy (2010) find out the seven categories for successful ERP implementation as follows:

Table 2.3: Seven Categories for Successful ERP Implementation

1. Business Plan and Vision
2. Change Management
3. Communication
4. ERP Team Composition
5. Project Completion
6. Project Champions
7. System Analysis, selection and technical implementation

Source: Supramaniam and Kuppusamy (2010)

Critics of former proposals can, for example, be found in the study of Sarker and Lee (2003) on three key factors of success usually considered as relevant: strong and committed leadership, open and honest communication, balanced and empowered implementation team.

2.10 ERP Adoption in Developing Countries

ERP system adoption has been rather predominant in developed countries for many years. The penetration of ERP system in firms in developing countries is seen in the past few years. There are a growing number of literatures on ERP in developing countries lately, especially in the context of Asian region. Zhang et al. (2003) analyze the success factor of ERP implementation in China, where the implementation success rate is significantly lower than in western countries (10% instead of 33% according to the authors). In relation with this, IEMC report (2002) state that most of the ERP software being developed in technically advanced countries, standards are often too high for under developed or developing countries. Huang and Palvia (2001, 276-284) review ERP implementation differences in developed and developing countries and conclude that economic status, government regulations, low IT maturity, firm size and lack of business process management experience as the major hindrance for firms in developing countries to reap the benefits from ERP investment. Nah and Delgado (2006, 99-113) on the other hand compare success factor differences between North America and Hong Kong firms. The author observes that firms in Hong Kong reap lower tangible and intangible benefits from ERP usage as they have lower information access capability and weak

reengineering and empowerment being the key success factors. Huang et al. (2004, 689-97) conduct a survey on various Taiwanese firms with a view to identifying the critical factors for ERP adoption failure. The findings indicate that time, project management capability, employee training and change management practice as the primary factors for ERP adoption failure. ERP systems are currently in high demand among Malaysian companies especially those in manufacturing and service based industries because it provides an effective management system leading to significant improvements in productivity (Supramaniam and Kuppusamy, 2010). They conducted a comprehensive study to identify the critical success factors and key benefits of ERP implementation using the response from 151 firms.

2.11 ERP Systems and Accounting

The increasing changes in the organization process and business process and the need for solutions to keep these changes are increasing, because without this adaptation firms will fail to survive and succeed in the environment as a whole (Nicolaou, 1999). Enterprise resource planning as an integral part of IT is an example, which aims to share common data across the organization and automate business process put the most important to provide or produce real time data, as well as enhance decision making process, planning and controlling of operations are more distinct advantages to companies adopting these solutions (Duff and Jain, 1998; Gupta, 2000). ERP systems only occur with the fourth stage systems where the ERP systems integrate cost management, financial reporting, and performance measurement (Kaplan and Cooper, 1998, 299). Quattrone and Hopper (2001, 420-26) find that with the implementation of the ERP system anyone with access to an ERP system can "exert control as they wish, slicing and dicing the organization and information, and defining what should be controlled, how and why, differently." They add that, "Integrated business functions decide what is best for each business area and accountants analyze how this can be obtained." They conclude by saying that if the centres of control are changed as with ERP implementation, it is necessary to re-conceptualize accounting and control. Since the information technology becomes the main driver in the world, traditional accounting are changed dramatically. According to

the IMA (1999, 3), students should view accountants as business partners rather than simply "scorekeepers" and encourages "accounting educators to develop the changes in the accounting curriculum" that reflect the two most critical work activities for management accountants today: strategic planning and process improvement, "neither of which is generally taught in the accounting curricula" (IMA 1999, 6-7). Similarly, the AICPA's *Core Competency Framework* expects accounting professionals in the 21st century to posses a "broad business perspective" in addition to technical competencies, and to function as *valued business partners* (AICPA, 2000, 1).

Booth et al. (2000) compare ERP users to their prior legacy systems and with those of non-ERP users. They conclude that ERP users are highly satisfied with reporting and decision support for finance and financial accounting but they are less satisfied for transaction processing. They found that ERP systems have only a small effect on the use of new management accounting practices that emphasize sophisticated manipulation of information. Granlund and Malmi (2002, 299-321) found that eight out of ten companies applied ABC in at least some parts of their organization but these ABC systems were not configured into ERPs. The reason for not using ABC models in ERPs was the current ERP system complexity. They found that ERPS did not influence the companies' decision to adopt ABC as many of these firms were already familiar with this concept. They concluded that ERPs do not seem to have a major influence on the development of balanced scorecards that are maintained in a spreadsheet or Lotus Notes environment or special software designed for that purpose. Hyvonen (2003,155-73) compares the ERP systems versus best of breed (BoB) systems and proved that when the motives were only either technical or strategic, the solutions were more often BoB and when the motives were technical and strategic the solution was more often ERP than BoB. He concludes that there is no correlation between the adoption of ERP systems and the use of modern cost accounting and modern management accounting techniques. The results indicated that 27% of the respondents have adopted activity-based costing (ABC) and 24% of all respondents have adopted balanced scorecard. Scapens and Jazayeri (2003, 201-33) found that there were not fundamental changes after the ERP implementation, in the nature of management accounting information but there were changes in the role of

management accountants such as the elimination of routine jobs, line managers with accounting knowledge, more forward looking information and a wider role for the management accountants. Spathis and Constantinides (2004, 234-47) found that integration of applications, real time information is the main reasons for Greek companies to adopt ERP systems. They report that after the ERP implementation a number of companies introduced financial ratio analysis, production of budgets, profit centers, absorption costing and profitability analysis per customer. They conclude that the fact that some potential benefits from ERP adoption have not been highly rated due to the infancy of these systems.

2.12 The Impact of ERP Implementation on Managerial Process

ERP is a broad term for any software application that integrates all business processes and data into a single system (Waxer, 2006). Expectations for ERP systems to change management accounting were first introduced by Kaplan and Cooper (1998), especially with the fourth of their four-stage model for cost and performance measurement systems. ERP systems only occur with the fourth stage systems where the ERP systems integrate cost management, financial reporting, and performance measurement. An ERP system allows the company to obtain cost and performance information more frequently, even daily, rather than waiting a month (Kaplan and Cooper, 1998). They say that the integration with ERP systems allow all managerial processes, including budgeting, what-if analysis, and transfer pricing to be also based on activities rather than only dollars. Activity-based budgeting gives companies the opportunity to authorize and control resources depending on accurate demand information. Davenport (1998) expected companies to change with the implementation of ERP system:

In addition to having important strategic implications, enterprise systems also have a direct, and often paradoxical, impact on a company's organization and culture. On the one hand, by providing universal, real-time access to operating and financial data, the systems allow companies to streamline their managerial structure, creating flatter, more flexible, and more democratic organizations. On the other hand, they also involve the centralization of control over information and the standardization of processes, which are

qualities more consistent with hierarchical, command-and-control organizations with uniform cultures.

Cook et al.'s (2000) field study suggests that ERP systems can increase the effectiveness of capital budgeting by anchoring financial numbers to activities rather than stopping at monetary measures with pre-ERP practices.

ERP facilitates company-wide integrated information system covering all functional areas. ERP provides for complete integration of systems not only across the departments in a company but also across the companies under the same management.

The changes which are affecting the core role of the management accountant are in large part due to the popularity of ERP systems such as SAP and Baan, particularly in large companies (Foote, 2006; Davenport, 1998).

In this new environment the management accountant must acquire a broad knowledge of the business, and add value to the organization, by bringing financial expertise to the management process and participating as team players. The management accountant must broaden the nature of their role and become a strategic manager (Collins, 1999s). Scapens and Jazayeri (2003) judged the ERP system to have led to a number of changes to management accounting, i.e., the elimination of routine jobs, line managers developing accounting knowledge, the production of more forward-looking information, and a wider role for management accountants. More specifically, they say the move from record-keeper to internal consultant requires management accountants to acquire new skills. Rather than being limited to information reporting, management accountants need to be advocates and change agents. Management accountants need to sell ideas for accomplishing strategy with information.

2.13 ERP and Supply Chain Management

An important role of ERP is to serve as a platform for other applications, such as customer relationship management (CRM) and supply chain management (SCM) (Ragowsky and Somen, 2002). With the increasing competition in the business world, the need for performance management in supply chain has been echoed concurrently, ERP plays a vital role in management control through facilitating company wide real time

information in managerial decision making. Its contribution is also worth mentioning in supply chain management and control. ERP system assists in supply chain decision making. But in some cases problem of ERP system hinders the process of performance management in supply chain (Chowdhury and Absar, 2010). The following are the few supply chain performance management problems due to ERP systems:

a) *Integration problem*:

According to Forshlund and Johnson (2007), from a focal company perspective, supply chain management is much about up and down stream process integration. They also mentioned that in a fully integrated supply chain the firm integrates its intra-organizational network with the intra-organizational networks of selected supply chain partners to improve efficiency and effectiveness. Kelle and Akbulut (2005) mentioned that sharing data regarding performance metrics such as lead times, quality specifications, return status etc. helps supply chain partners to identify and overcome the bottlenecks in the supply chain. They argue that even if ERP software provides different tools that can support supply chain integration, at the same time it has several features that prevent the integration with business partners. They based their analysis on the inventory management aspects of supply chain coordination and their results can be used in enterprise software to measure the potential monetary value of policy coordination, to promote cooperation, and minimize the total supply chain system cost. Themistoceleous et al. (2001) stated that integration problems were faced when companies attempted to tie up the ERP system with a number of existing applications. They added that ERP systems are not so reliable for integration problems because of coexistence of other applications with ERP modules. In short, as mentioned by Themistoceleous et al. (2001), ERP technology does not offer an integrated solutions but it amplifies the need for application.

b) *Reporting problem:*

Forshlund and Johnson (2007) revealed that in their research most of the participants accepted that their ERP systems are dysfunctional and they have to manually print the reports through Excel. Bourne et al. (2000) mentioned that delay occurs in performance measurement and report generation in ERP based

systems and managers cannot cope up with new systems and report writers software may corrupt.

c) *Conflict with business strategy:*

Loinsky (1995) mentioned that ERP systems in many cases conflict with business strategy with business strategic alignment in the organization which is a precondition for performance management as per Forshlund and Johnson (2007). Themistoceleous et al. (2001) also stated that companies have abandoned their way of doing business due to the non-flexible nature of the ERP systems.

ERP vendors claim different types of remedial measures for the aforesaid problems. They are trying to overcome the hurdles and challenges and now they have solutions to address the problems as they had previously. By segmenting the markets they are also addressing to solve specific problems in specific arena .For instance, SAP approach to supply chain coordination and integration through two areas: supply chain management and supply chain performance management. SAP SCM offers a range of options for reporting events to SAP event management, including Direct Reporting, Transfer from the application system, Reporting via the internet, Electronic Data Interchange (EDI) support, Extensible Markup Language (XML) support, Voice Recognition etc. Oracle assists in integration by its integrated supply, demand and transportation planning with transportation execution and sharing real time information to the trading partners with improved visibility, event management and different models such as Online portal access for all trading partners, secure remote access from any location, trading partner specific data mapping, etch. Oracle offers flexibility and accessibility of metrics across the organization so that users can make smarter decisions.

Monk and Wagner (2009) state the relationship between ERP and SCM and also the significance of ERP on SCM as follows:

> The development of supply chain strategies does not necessarily require an ERP system. Before ERP systems were available, companies could be linked with customers and suppliers through electronic data interchange (EDI) system. A well-developed ERP system, however, can facilitate SCM because the needed production planning and purchasing system are already in place. In addition, the integration of accounting data in the ERP system allows management to evaluate

> changes in the market and make decisions about how those changes should affect the production plan. With an ERP system, sharing production plans along the supply chain can occur in real time.

2.14 Human Resources with ERP Systems

With an integrated ERP system, a company can store employee information electronically, eliminating the piles of papers and files that make the retrieval of information difficult. A good information system allows all relevant information for an employee to be retrieved within a second. Successfully using a human resources ERP system requires managing a significant amount of detailed information. Monk and Wagner (2009) mention,

> The SAP ERP Human Resource (HR) modules provide tools for managing an organization's role and responsibilities, definitions, personal employee information, and tasks related to time management, payroll, travel management, and employee training.

Most companies have an organization chart or plan that helps define management responsibilities. Without an ERP system, the organizational chart defines only the management relationships among employees. On the other hand, with an ERP system, the organizational chart provides a structure with more detail than a typical organizational chart and supports HR tasks such as recruiting, employees and planning organizational changes. According to Monk and Wagner (2009), SAP ERP provides an organization and Staffing plan tool that is used to define a company's management structure and the positions within the organizational structure as a whole. Complete and accurate human resource data simplify a manager's duties. The manager's Desktop tool within the SAP HR module provides access to all the Human Resources data and transactions in one location. Human resources data are very sensitive because they are related to employee's personal information, so controlling access to them is critical. An advantage of an integrated information system over a paper-based legacy system is that controlling access to data is automated; managers can use the system to determine which users should have access to various data.

Chapter Summary

To sum up the discussion, it can be said that the ERP system is a tool assembling and integrating all data and management skills which represent the firm's activity, in a unique database. ERP has its roots in manufacturing and material requirement planning. Its implementation process is complex and risky. It is time consuming and costlier exercise as well. ERP integrates people and data while eliminating the need to update and repair many separate computer systems. ERP allows management to manage operations, not just monitor them. ERP changes the way to do business and it affects accounting process and accounting information qualities to a greater extent.

Chapter 3

USEFULNESS OF ACCOUNTING INFORMATION AND EARNINGS MANAGEMENT

PART-A: Usefulness of Accounting Information

PART-B: Earnings Management

USEFULNESS OF ACCOUNTING INFORMATION AND EARNINGS MANAGEMENT

PART-A: Usefulness of Accounting Information

3A.1 Introduction

Accounting information comprises of two words: accounting and information. Accounting is an information system that generates and communicates information for a wide range of users to make better decisions. Parker (1996) defines accounting as, "The preparation and communication to users of financial and economic information. The information ideally possesses certain qualitative characteristics. Accounting involves the measurement, usually in monetary terms, of transactions and other events pertaining to accounting entities. Accounting information is used for stewardship, control and decision-making." On the other hand, information is simply processed data. Romney and Steinbart (2003) define information as, "Data that have been organized and processed to provide meaning." The word 'meaning' is coined in the definition of information in the sense that information is to be meaningful for decision-making. Accounting information can be either financial (for example, profit, asset, liability etc.) or non-financial (for example, number of workers, production capacity, corporate governance etc.). But mostly accounting information is monetary or financial by nature. Accounting information serves the diversified needs of two groups of users; one is internal users including different functional managers and employees, and the other is external users covering a wider range of community namely investors, creditors, tax authorities, regulatory agencies, customers, economic planners, competitors etc. Financial statements or reports are the reservoir of financial or accounting information. The International Accounting Standards Board (IASB) in its updated Conceptual Framework 2010, states in QC2, "Financial reports provide information about the reporting entity's economic resources, claims against the reporting entity and the effects of transactions and other events and

conditions that change those resources and claims. This information is referred to in the Conceptual Framework as information about the economic phenomena."

3A.2 Definition of Conceptual Framework

Conceptual framework consists of two terms: Conceptual and framework. Conceptual means "idea or plan". On the other hand, "framework" means essential supporting structure or basic structure". So conceptual framework for accounting information stands for- the plan or ideas of basic structure of generating and presenting accounting information to a diversified group of users for decision making. To provide a more rigorous way of setting standards and increasing financial statement users' understanding and confidence in financial reporting, the FASB instituted a conceptual-framework project. The board described this project as follows:

> A conceptual framework is a constitution, a coherent (intelligent or consistent) system of interrelated objectives and fundamentals that can lead to consistent standards and that prescribes the nature, function and limits of financial accounting and financial statements. The objectives identify the goals and the purposes of accounting. The fundamentals are the underlying concepts of accounting- concepts that guide the selection of events to be accounted for, the measurement of those events and the means of summarizing and communicating to interested parties. Concepts of that type are fundamentals in the sense that other concepts flow from them and repeated references to them will be necessary in establishing, interpreting and applying accounting and reporting standards.

The conceptual framework is like a constitution, i.e., a democracy of accounting for the standard setting process.

3A.3 Need for Conceptual Framework

Generally speaking, the rationale behind developing a conceptual framework is to widen the acceptability to users, to increase users' understandability and to provide proper accounting treatment.

Two needs of developing such framework are as follows:

1. To ensure worldwide acceptability of accounting and to enhance the users' understanding of and confidence in financial reporting and
2. New and practical problems relating to accounting in the complex business field can be solved with the help of such framework.

FASB has identified four specific benefits that would result from a conceptual framework. A conceptual framework, when completed, would:

- Guide the FASB in establishing accounting standards;
- Provide a frame of reference for resolving accounting questions in the absence of specific promulgated standards;
- Determine the bounds of judgment in preparing financial statements;
- Enhance comparability by decreasing the number of alternative accounting methods.

3A.4 Development of Conceptual Framework

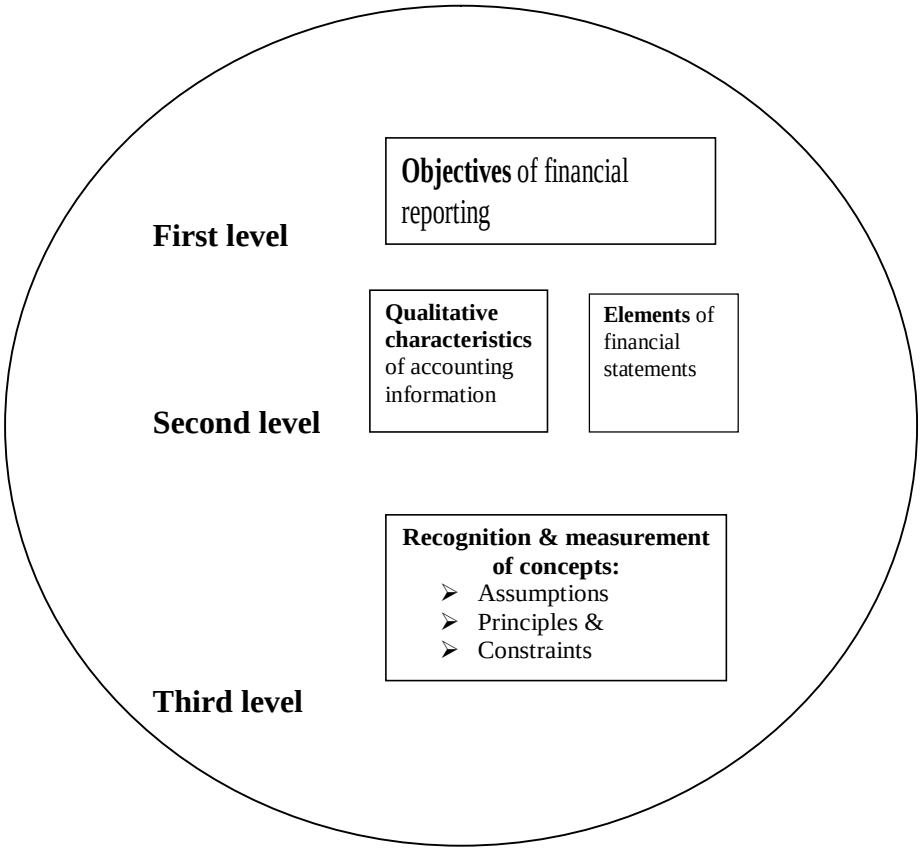
There are several organizations and individuals who have tried their best to develop a sound conceptual framework for a long period of time. But among them, Accounting Principles Board (APB) and Financial Accounting Standards Board (FASB) merit attention.

APB: APB issued," Basic concepts and Accounting Principles Underlying Financial Statements of Business Enterprises," through APB statement No. 4. This describes the accounting practice for the first time.

FASB: Taking into account the need for a generally accepted framework, the FASB in 1976 develops, "Conceptual Framework for Financial Accounting and Reporting: Elements of Financial Statements and Their Measurement." Since then, the FASB has issued six statements relating to financial reporting for business enterprises under the umbrella of such developed framework.

3A.5 Conceptual Framework- at a glance

Figure 3.1: Conceptual Framework at a glance



- The **first level** explains the 'why'- goals and purpose of accounting.
- The **second level** links up the first level with the third level and
- The **third level** describes the' how'- implementation of accounting rationally.

3A.5.1 First Level- Objectives of Financial Reporting

Investors and creditors are two most significant users of accounting information from business point of view. Investors are generally interested mainly in returns from dividends and increases in the market price of their investments. Creditors would like to know whether the business can repay a loan plus interest according to required

terms. Thus both investors and creditors need to know if a company can generate adequate cash flows or not. Financial reporting (financial statements) is important to both groups in making this judgment. They offer valuable information that is relevant in both investment and credit decision. Financial reporting serves basically three objectives:

Table 3.1: Financial reporting- users and decision

Objective	Users	Decision
First	Investors and creditors	For investment and credit decision [These users must have a reasonable understanding of business and economic activities]
Second	Users specifically Present and potential investors and creditors	For cash flow projection [In assessing the amounts, timing and uncertainty of future cash flows]
Third	To a diversified group of users	About economic resources, the claims on these resources and the changes in them.

Source: Researcher's own compilation

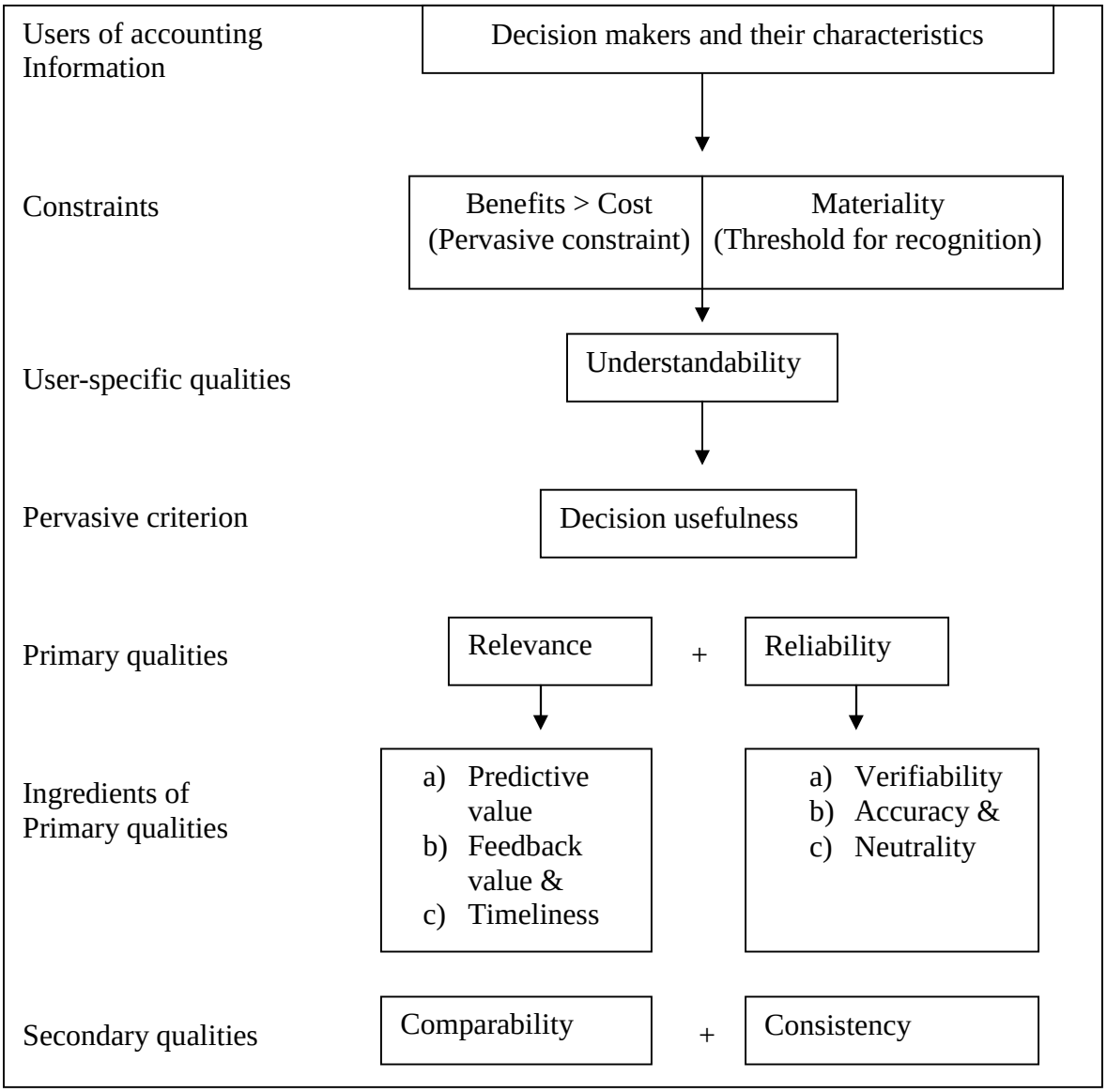
3A.5.2 Second Level- Qualitative Characteristics of Accounting Information

The FASB identifies the qualitative characteristics of accounting information that provides better (more useful) information for better decision-making by the users. (Janas and Blanchet, 2000, 353-363) recommend FASB Conceptual Framework (1976) to define the quality of accounting and financial reporting in relation to the usefulness of accounting information to the users (primarily defined as investors and creditors). The FASB (Financial Accounting Standards Board) identified the qualitative characteristics of accounting information that distinguish better (more useful) information from inferior (less useful) information for decision-making purposes (SFAC No. 2, 1980). In its Concepts Statements, the FASB argues that quality must be defined in terms of the overall objective of financial reporting, i.e., to provide users with information useful for making investment, credit, and similar decisions. The FASB then defines the qualitative

characteristics necessary for meeting the stated objectives. SFAC No. 2 examines the characteristics that make accounting information useful.

These characteristics are shown below in a figure:

Figure 3.2: Qualitative characteristics of accounting information



Source: SFAC No. 2, 1980

The qualitative characteristics of accounting information have been discussed elaborately with examples as follows:

Users of accounting information:

There is a divergent group of users (internal and external) of accounting information. Their decisions may vary widely. So they need relevant and reliable accounting information. Users' judgment as to the usefulness of accounting information depends on several factors. SFAC No. 2 suggests,

> Judgment is influenced by factors such as the decisions to be made, the methods of decision making to be used, the information already possessed or obtainable from other sources, and the decision makers' capacity (alone or with professional help) to process the information. The optimal information for one user will not be optimal for another. Consequently, the Board, which must try to cater to many different users while considering the burdens, placed on those who have to provide information, constantly treads a fine line between requiring disclosure of too much information and requiring too little.

Constraints:

Cost benefit consideration and materiality are two important constraints in the hierarchy of accounting qualities. They are elaborated as follows:

a. costs benefits consideration:

The consideration of benefits and cost is a constraint rather than a characteristic of accounting information. The basic theme is:

Benefits of using information > Cost of generating and providing information

Information is a valuable product, but it is not cost-free. SFAC No. in para. 137 as,

> The cost of providing information are of several kinds, including costs of collecting and processing the information, costs of audit if it is subject to audit, costs of disseminating it to those who must receive it, costs associated with the dangers of litigation, and in some instances costs of disclosure in the form of a loss of competitive advantages vis-à-vis trade competitors, labor unions with a consequent effect on wage demands), or foreign enterprises. The costs to the users of information, over and above those costs that preparers pass on to them, are mainly the costs of analysis and interpretation and may include costs of rejecting information that is redundant, for the diagnosis of redundancy is not without its cost.

This constraint holds that the benefits of using the accounting information must be greater than the cost of generating and presenting it to the users. If the cost is greater than the benefit, what would happen?

Users of accounting information will be benefited certainly. On the contrary, the business entity will be financially looser. It will negatively affect the operational profit of the entity. Benefits go in favor of the preparers as well. Concept Statement says,

> Most of the costs of providing financial information fall initially on the preparers, while the benefits reaped by both preparers and users. Ultimately, the costs and benefits are diffused quite widely. The costs are mostly passed on to the users of information and to the consumers of goods and services. Much published information would be compiled for the preparers' own use even if providing it to stockholders and others were not required. The preparer enjoys other benefits also, such as improved access to capital markets, favorable impact on the enterprise's public relations, and so on (SFAC No. 2 1980).

The FASB emphasizes the importance of cost-benefit considerations:

Before a decision is made to develop a standard, the Board needs to satisfy itself that the matter to be ruled on represents a significant problem, and that a standard that is promulgated will not impose costs on the many for the benefit of the few. If the proposal passes that first test, a second test may subsequently be useful. There are usually alternative ways of handling an issue. Is one of them less costly and only slightly less effective? Even if absolute magnitudes cannot be attached to costs and benefits, a comparison between alternatives may yet be possible and useful.

Example:

- A business entity wants to install a computerized accounting information system. Before doing so, it will justify whether the benefits of using the system is greater than the costs associated with the setup of the system and the generation of accounting information by the system.
- A business entity may not provide information about competitors because the cost of producing such information is high. (Management has to hire expertise to know about the competitors which is costly).

b. Materiality:

Accounting information is material when it has some sort of significance on users' decision-making process. The inclusion or omission of a material item can change the

users' decision. Belkaoui (2000) regards materiality as a threshold for recognition. He further states,

> Materiality is a state of relative importance. Basically, consideration must be given to whether or not the information is likely to have a significant or material impact on decisions.

The FASB's position on the subject is best illustrated by the following statement:

> The Board's present position is that no general standards of materiality could be formulated to take into account all the considerations that enter an experienced human judgment. However, that position is not intended to imply either that the Board may not in the future review that conclusion or that quantitative guidance on materiality of specific items may not approximately be written into the Board's standards from time to time. That has been done on occasion already (for example, in the statement on financial reporting by segments of a business enterprise), and the Board recognizes that quantitative materiality guidance is sometimes needed. …However, whenever the Board or any other authoritative body imposes materiality rules, it is substituting generalized collective judgment for specific individual judgments, and there is no reason to suppose that the collective judgments are always superior.

Guidelines or criteria to be used in determining materiality are urgently needed. Belkaoui (2000) suggests two approaches: the size approach and the change criterion approach. The size approach relates the size of the item to another relevant variable, such as net income. The FASB Discussion Memorandum on materiality suggests criteria based on the size approach:

> If the amount of its current or potential affect equals or exceeds 10 percent of a pertinent financial statement amount, the matter should be presumed to be material. If its amount or current potential effect is between 5 and 10 percent of a pertinent financial statement amount, the materiality of the manner depends on the surrounding circumstances.

The second approach is advocated primarily by Rappaport (1964), who contends that materiality criteria can be stated in terms of financial averages, trends, and ratios that express significant analytic relationships in terms of accounting information.

Example:

A business entity does not show the value of a paperweight as a fixed asset because it's price is negligible in comparison with that of equipment. The recording of the paperweight not as a fixed asset is not material for users' decision.

User-specific quality-understandability:

Understandability of the users' can be viewed from both the parties: the preparers of accounting information and the users of the same.

I. The preparers of accounting information:

The providers of accounting information should prepare and provide the accounting information in a way so that it is understandable to the users. For instance, while using the accounting terminology, the providers of accounting information should not use complicated terms. The term,' Machinery' is more understandable to the users than the term, 'Plant asset.'

II. The users of accounting information:

Understandability of the users' mostly depends on their reasonable knowledge of business and economic activities and accounting. Not only that, users' intention to study the information with reasonable diligence is also required. So it does not make any sense if the providers of accounting information present the information in an understandable way to the users who have no business and accounting knowledge. The FASB elaborates as follows:

> Financial information is a tool and like most tools, cannot be of much direct help to those who are unable or unwilling to use it or who misuse it. Its use can be learned, however, and financial reporting should provide information that can be used by all- non-professionals – who are willing to learn to use it properly. Efforts may be needed to increase the understandability of financial information. Cost-benefit considerations may indicate that information understood or used by only a few should not be provided. Conversely, financial reporting should not exclude relevant information merely because it is difficult for some to understand or because some investors or creditors choose not to use it (par. 36).

The benefits of information may be increased by making it more understandable and hence, useful to a wider circle of users. Understandability of information is governed by a combination of user characteristics and characteristics inherent in the information., which is why understandability and other user –specific characteristics occupy a position in the hierarchy of qualities as a link between the characteristics of users (decision makers) and decision-specific qualities of information.

Under the FASB model, for accounting information to be useful to users, it must possess two primary qualities: relevance and reliability.

3A.6 Primary Qualities-Relevance and Reliability

As stated in SFAC No. 2, "the qualities that distinguish 'better' (more useful) information from 'inferior' (less useful) information are primarily the qualities of relevance and reliability, with some other characteristics that those qualities imply" (Par. 15). Relevance is the primary quality that should be prioritized over reliability in the conceptual framework. George et. al (2010, 234) says that

> Relevance must be considered before the other qualitative characteristics because relevance determines which economic phenomena should be depicted in financial reports.

If either is missing completely from a piece of information, the information will not be useful. The IASB Framework for the Preparation and Presentation of Financial Statements (IASB, 2001) says in paragraph 26 that information is relevant

> when it influences the economic decisions of users by helping them evaluate past, present or future events or confirming, or correcting, their past evaluations.

Relevance has been loosely defined as

> For information to meet the standard of relevance, it must bear on or be usefully associated with the action it is designed to facilitate or the result it is desired to produce. This requires that either the information or the act of the communicating exert influence… on the designated actions (AAA, 1966; Belkaoui, 2000, 139).

SFAC No. 2 (FASB Concepts Statement 2) says in paragraph 47 that, to be relevant,

> Accounting information must be capable of making difference in a decision by helping users to form predictions about the outcomes of past, present, and future events or to confirm or correct expectations.

Relevant information is described as confirming or correcting prior expectations, or assisting in forming future expectations (ICANZ, 2001; Cocker, 2005, 8). Information that has no impact on a decision is irrelevant. Relevance is a quality emphasized in every accounting framework. For example, the income statement provides information about how a business entity performed over a certain period (feedback value); it helps in planning for the next year (predictive value) and it also must be communicated soon after the end of the accounting period to enable the reader to make decisions (timeliness). The example clearly spotlights on the ingredients of relevance.

Reliability depends on the degree of faithfulness in the representation of an event. Reliability refers to the "Quality which permits users of data to depend on it with confidence as representative of what it proposes to present" (AAA, 1977; Belkaoui, 2000, 140). The IASB Framework says that "to be reliable, information must represent faithfully the transactions and other events it either purports to represent or could reasonably be expected to represent" (Par. 33). In its glossary of terms, SFAC No. 2 defines reliability as the quality of information that assures that information is reasonably free from error or bias and faithfully represents what it purports to represent. With respect to measures, it states that " the reliability of a measure rests on the faithfulness with which it represents what it purports to represent, coupled with an assurance for the user, which comes through verification, that it has that representational quality" (Par. 59). Reliable information is described as corresponding to underlying transactions, as well as being verifiable and neutral (ICANZ, 2001; Cocker, 2005, 8). For example, the balance sheet should represent the assets, liabilities, and owner's equity of a business enterprise over a certain period of time as faithfully as possible (accuracy) without any bias (neutrality), which can be verifiable by an auditor (verifiability). It is clear from the example that reliability comprises of three key components. The FASB acknowledges that it is a subjective assessment, and often there must be a trade-off between relevance

and reliability. No matter how reliable, if information is not relevant to the decision at hand, it is useless. Conversely, relevant information is of little value if it cannot be relied on. SFAC No. 2 also identifies few principal ingredients of relevance and reliability.

3A.7 Ingredients of Primary Qualities

3A.7.1: Relevance

Relevance, according to the FASB Concepts Statement 2, comprises of predictive value, feedback value and timeliness. IASB Framework uses the term 'confirmatory value' instead of 'feedback value.' The summarized ingredients of relevance are given below:

3A.7.1. a: Predictive Value

Relevant information is expected to help users predict the ultimate outcome of past, present, and future events. IASB Framework paragraph 28 explains that information need not be an explicit forecast to have predictive value, and that the predictive value of information is enhanced by the manner of display, citing the example of separately disclosing unusual, abnormal and infrequent items of income or expense. FASB Concepts Statement 2, paragraph 53, similarly explains that "to say that accounting information has predictive value is not to say that it is itself a prediction. … Predictive value here means value as an input into a predictive process, not value directly as a prediction." Relevant information is capable of reducing uncertainty about the future. Information enables the users to gain both predictive and feedback value simultaneously. FASB Concepts Statement 2 puts an argument that,

> Usually, information does both at once, because knowledge about the outcome of actions already taken will generally improve decision makers' abilities to predict the results of similar future actions. Without knowledge of the past, the basis for a prediction will usually be lacking. Without an interest in the future, knowledge of the past is sterile (Par. 51).

Predictive value has got two dimensions, namely earnings persistence and disaggregated information (Janas and Blanchet, 2000, 353-363). Information need not itself be a

prediction of future events or outcomes to be useful in forming, confirming, or changing expectations about future events or outcomes. Information about the present status of economic resources or obligations or about an enterprise's past performance is commonly a basis for expectations (Par. 48, Concept Statement 1). An important similarity and an important difference between predicting the weather and predicting financial performance may be noted. The similarity is that the meteorologist's information and the information derived from financial reporting both have to be fed into a predictive model (A model is no more than a simplified, scaled-down representation of a situation that is to be analyzed. Typically, sophisticated models are expressed in terms of mathematical equations) before they can throw light on the future. Financial predictions, like weather forecasts, are the joint product of a model and the data that go into it. A choice between alternative accounting methods on the basis of their predictive value can be made only if the characteristics of the model to be used are generally known. ….. The point is that the predictive value of information cannot be assessed in the abstract. It has to be transformed into a prediction, and the natures of transformation as well as the data used determine the outcome. The difference is clarified in paragraph 55 as

> The important difference between meteorological and financial prediction is that only exceptionally can meteorological predictions have an effect on the weather, but business or economic decision makers' predictions often affect their subjects. For example, the use of financial models to predict business failures looks quite successful judged in the light of hindsight by looking at the financial history of failed firms during their last declining years. But a prediction of failure can self-fulfilling by restricting a company's access to credit.

3A.7.1.a.i. Earnings Persistence

Janas and Blanchet (2000, 353-363) says, "A shorthand way of thinking about earnings persistence is to ask whether the information is useful in assessing the likely levels of recurring earnings, i.e., the company's sustainable earnings potential." That is, Predictive value in terms of earnings persistence implies usefulness to the investors in assessing the future prospects (the likely levels of recurring earnings) of the company.

3A.7.1.a.ii. Disaggregated Information

Janas and Blanchet (2000, 353-363) focuses on this characteristic by saying, "A shorthand way of thinking about predictive value of disaggregated information is to ask whether the information permits users to identify and assess the differing opportunities and risks contained within the company's various businesses". That is, predictive value in terms of disaggregated information implies usefulness to the investors in assessing the future prospects (the likely levels of segmented information) of the company.

3A.7.1. b: Feedback Value

Paragraph 27 of IASB Framework says, "the predictive and confirmatory roles of information are interrelated," illustrating that with an example about the utility, for both of those roles, of information about current asset holdings. FASB Concepts Statement 2 uses "feedback value" rather than confirmatory role, but paragraph 52 notes that "disclosure requirements almost always have the dual purpose of helping to predict and confirming or correcting earlier predictions," illustrating that with the examples of business segment information and interim reporting. The concept is the same. Both the accounting reports focus on the feedback value i.e., focuses on past performance and enhance the investors ability to predict or forecast the trend of earnings or annual earnings before the year-end. The IASB in its updating conceptual framework states,

> Information that has predictive value often also has confirmatory value. For example, revenue information for the current year, which can also be compared with revenue predictions for the current year that were made in past years.

Predictive and feedback value–both are interrelated. Paragraph 51 explains the fact: Usually, information does both at once, because knowledge about the outcome of actions already taken will generally improve decision makers' abilities to predict the results of similar future actions. Without knowledge of the past, the basis for a prediction will usually be lacking. Without an interest in the future, knowledge of the past is sterile.

3A.7.1. c: Timeliness

In IASB Framework paragraph 43, timeliness is cited as a necessary constraint lest information lose its relevance. In FASB Concepts Statement 2, paragraph 56, timeliness is considered as

> An ancillary aspect of relevance. If information is not available when it is needed or becomes available only so long after the reported events that it has no value for future action, it lacks relevance and is of little or no use. Timeliness in the present context means having information available to decision makers before it loses its capacity to influence decisions.

The extents or degrees of timeliness may vary from situation to situation. For example, it may take few hours or days in a fast-moving situation like strike or a take-over bid whereas routine decision requires timely information after a fixed time interval. Again a trade-off is often required to make between timeliness and precision, completeness or reliability of information. Precision or other qualities of information are sacrificed to achieve timeliness in few situations, which is sometimes wanted. This is evident in managerial decision-making where timeliness is more warranted rather than precision. Concepts statement 2 explains the fact as, "It may sometimes be desirable, for example, to sacrifice precision for timeliness, for an approximation produced quickly is often more useful than precise information that takes longer to get out" (Par. 57). For such a trade-off, overall usefulness is the key point to consider. Timeliness alone cannot make information relevant, but a lack of timeliness can rob information of relevance it might otherwise have had.

3A.7.2: Reliability

Reliability is said, in FASB Concepts Statement 2, to comprise representational faithfulness, verifiability, and neutrality. It is said in the IASB Framework to comprise faithful representation, substance over form, neutrality, prudence, and completeness.
The major ingredients of reliability according to FASB Concepts Statement 2 are discussed below:

3A.7.2. a: Representational Faithfulness

The IASB Framework says that "to be reliable, information must represent faithfully the transactions and other events it either purports to represent or could reasonably be expected to represent" (par. 33). Concepts Statement 2 says that "representational faithfulness is correspondence or agreement between a measure or description and the phenomenon it purports to represent. In accounting, the phenomena to be represented are economic resources and obligations and the transactions and events that change those resources and obligations" (par. 63). The faithfulness of representation of information depends on the meaning of the words 'Purports to represent'. According to Concepts statement 2, "Sometimes, but rarely, information is unreliable because of simple misrepresentation." Concepts statement 2 illustrates such misrepresentation citing an example of receivables. Receivables may represent large sums as collectible that in fact, are uncollectible. This type of unreliability is difficult to detect. Another important thing in this respect is whether the user is uninformed or reasonably informed. The reliability of accounting information according to the statement assumes a reasonably informed user (Par. 36-41). The Concept statement illustrates this by stating that the information provided by financial reporting often results from approximate, rather than exact, measures involving numerous estimates, classifications, summarizations, judgments, and allocations. The problem is that accounting information may not represent faithfully what it purports to represent because of bias. This bias can be either measurer bias or measurement bias. These will be discussed under the next section in details.

3A.7.2. b: Verifiability

The IASB Framework does not include verifiability among its qualities. However, it does say that "information has the quality of reliability when it is free from material error and bias and can be depended upon by users" (par. 31). The FASB framework defines verifiability as "the ability through consensus among measurers to ensure that information represents what it purports to represent or that the chosen method of

measurement has been used without error or bias." The Accounting Principles Board (APB) defines verifiability in APB Statement No. 4, Basic Concepts and Statements of Business Enterprises: "Verifiable financial accounting information provides results that would be substantially duplicated by independent measurers using the same measurement methods" (Par. 90). Verification may successfully reduce measurer bias rather than measurement bias. It does neither guarantee that measures used are relevant to the decisions nor it provides a high degree of representational faithfulness. According to Concepts Statement 2, some accounting measurements are more easily verified than others. The statement explains this fact by citing examples of cash, receivables, inventories and depreciable assets. Cash has high level of verifiability; receivables with less degree of verifiability; inventories with still less degree of verifiability and finally depreciable assets have least degree of verifiability. As there are more disagreements about depreciation methods, useful lives, salvage value and so on. The Statement concludes that, "Verifiability means no more than that several measurers are likely to obtain the same measure. It is primarily a means of attempting to cope with measurement problems stemming from the uncertainty that surrounds accounting measures and is more successful in coping with some measurement problems than others" (Par. 89). It goes on to discuss verifiability, identifying three key aspects: (i) consensus among observers, (ii) assurance of correspondence to economic things and events, and (iii) direct verification versus indirect verification.

3A.7.2.b.i. Consensus among Observers

According to Concepts Statement 2 "Verification implies consensus" (par. 84). That is to say, verification requires consensus among observers (measurers). Johnson (2005) states that accounting measures that are determined by one measurer must be confirmed or substantiated by other measurers that reach essentially the same result from measuring the same phenomenon. However, consensus among observers cannot be measured in isolation. Rather, it must be measured with regard to both correspondence to economic things and events and direct versus indirect verification.

3A.7.2.b.ii. Assurance of Correspondence to Economic Things and Events

Concepts Statement 2 states that "the purpose of verification is to provide a significant degree of assurance that accounting measures represent what they purport to represent" (par. 81, emphasis added), that is, real-world economic phenomena. From this, it is clear that the purpose of verification is to provide assurance with regard to the correspondence of accounting information to real-world economic phenomena. The problem is that accounting information may not correspond to economic phenomena because of measurer bias, measurement bias or both. Measurer bias may be either intentional (such as lack of integrity or fraud) or unintentional (such as lack of skill i.e., simply mistake). Measurement bias results from selecting a measurement method that may not produce a result that represents what it purports to represent (such as selection of FIFO inventory method always overstates gross profit in the days of rising prices). In such a way, even though there is consensus among measurers, an indirectly verified measurement may not be reliable if the measurement method (accounting or allocation) results in a measure that does not correspond to the economic phenomena that it purports to represent.

3A.7.2. b.iii. Direct Verification versus Indirect Verification

The accounting or allocation measure itself is verified with direct or separate verification (For example, counting cash, counting inventory etc.). Under indirect verification, the accounting measure is verified by checking the inputs and recalculating the outputs, using the same accounting methodology (For example, the carrying amount of inventory is indirectly verified by checking the quantities and costs (inputs) and then by recalculating the ending inventory using the same accounting method. "Direct verification tends to minimize both measurer bias and measurement bias. In contrast, indirect verification tends to minimize only measurer bias and not any measurement bias from the selection of accounting or allocation methods" (Johnson, 2005, 5).

3A.7.2. c: Neutrality

The IASB Framework equates neutrality to freedom from bias and says "financial statements are not neutral if, by the selection or presentation of information, they influence the making of a decision or judgment in order to achieve a predetermined result or outcome" (par. 36). The FASB framework defines neutrality as "the absence in reported information of bias intended to attain a predetermined result or to induce a particular mode of behavior." Information provided should be free from bias which does not mean to say that information providers or standard setters should not have any purpose back of their minds for financial reporting. Concepts Statements No. 2 in paragraph 99 clearly justifies this by stating, "Of course, information must be purposeful. But a predetermined purpose should not imply a predetermined result. For one thing, the purpose may be to serve many different information users who have diverse interests, and no one predetermined result is likely to suit them all." There is an argument against the acceptance of accounting neutrality because of feedback effect. Concepts Statement 2 spotlights on this issue as, "Information that reports on human activity itself influences that activity, so that an accountant is reporting not on some static phenomenon but on a dynamic situation that changes because of what is reported about it" (Par. 102).

3A.8 Secondary Qualities

Comparability and consistency are the secondary qualities suggested by the FASB Statement of Financial Accounting Concept No. 2. Information about an enterprise is more useful if it can be compared with similar information about another enterprise (comparability) and with similar information about the same enterprise over time (consistency).

3A.8.1 Comparability

Information that has been measured and reported in a similar manner for different enterprises is to be treated as comparable. The users compare between similar information of different enterprises and have practical ideas about the similarities and the differences of information. This will enable the users to make the right decision. To be

comparable, both the enterprises should be of the same nature. Belkaoui (2000) states, "Comparability describes the use of the same method over time by a given firm". FASB Statement of Financial Accounting Concepts No. 2 states, "Defined in the broadest terms, comparability is the quality or state of having certain characteristics in common, and comparison is normally a quantitative assessment of the common characteristic. Clearly, valid comparison is possible only if the measurement used- the quantities or ratios- reliably represent the characteristic that is the subject of comparison" (par. 115). Comparability involves difficulty as well. Concepts Statement explains this as, "the difficulty in making financial comparisons among enterprises because of the use of different accounting methods has been accepted for many years as the principal reason for the development of accounting standards." Despite this difficulty, comparisons intend to identify and explain similarities and differences. For example, net income or asset of a company can be compared within another company in the same industry.

3A.8.2. Consistency

When an entity applies the same accounting treatment to similar events, from period to period, the entity is considered to be consistent in the use of accounting standards. However, this does not mean that an entity cannot change particular method of accounting to another if required. The entity can change any accounting method if it is properly justified. APB Opinion No. 21 *Accounting Changes,* states that, "The presumption that an entity should not change an accounting principle may be overcome only if the enterprise justifies the use of an alternative acceptable accounting principle on the basis that is preferable. …The nature and justification for a change in accounting principle and its effect on income should be disclosed. …The justification for the change should explain why the newly adopted accounting principle is preferable." So consistency if violated is acceptable when it is backed by proper rationale. Consistent use of accounting treatment is significant for accounting. In this regard, FASB Statement of Financial Accounting Concepts No. 2 states in paragraph 120, "Consistency in applying accounting methods over a span of time has always been regarded as an important quality that makes accounting numbers more useful". But too much consistency may not be desirable for accounting growth as it prohibits accounting changes. For example, the

managers of a firm cannot change its depreciation methods without any rationalization due to consistency.

3A.9 Trade-offs between Relevance and Reliability

FASB Concepts No. 2 in 1980 recognizes a possible trade-off situation between relevance and reliability. The FASB (1980) states that "…reliability may suffer when an accounting method is changed to gain relevance and vice versa." This trade-off situation is also mentioned in many other pieces of literature including: Brownlee, Ferris and Haskins (2001); Healy, Myers and Howe (2002); and Entwistle and Phillips (2003). In addition, it is also recognized that users and preparers hold different perceptions of relevance and reliability (Hooper, 1997). Both relevance and reliability will vary among different users and situations. Cocker (2005) states that relevant information is not useful to a user because the information relates to a present matter or subject, but because the user perceives that the information relates to a present matter or subject. Similarly, reliability is whether the user perceives that he or she can depend on the information. The objective of making trade-offs is quite simple. Concept statement 2 acknowledges that different FASB constituents and different group of these constituents may have different views about what the trade-offs between relevance and reliability should be. The reason is that they attach different importance to one quality as opposed to another and that is why, their willingness to trade one quality for another will differ as well. Johnson (2005) for example states, "Preparers are likely to place greater importance on the reliability of measures in financial statements in order to pass audit scrutiny. Similarly, auditors are likely to place greater importance on the reliability of measures in the financial statements that they audit because of their logical exposure. In contrast, investors might place greater emphasis on the relevance of those measures in forecasting the entity's future earnings or financial position". Concepts Statement 2 concludes that even though considerable agreement exists about the qualitative characteristics that 'good' accounting information should have, no consensus can be reached about their relative importance in a specific situation because different constituents perceive themselves as having different needs. Hence it acknowledges that information may possess both characteristic and it

cautions that neither characteristic can be dispensed with entirely. Although financial information must be both relevant and reliable to be useful, information may possess both characteristics to varying degrees. It may be possible to trade relevance for reliability or vice versa, though not to the point of dispensing with one of them altogether. Information may also have other characteristics shown on the chart to varying degrees, and other trade-offs between characteristics may be necessary or beneficial (FASB, 1980). Concepts statement 2 addresses the importance of reliability in financial statements in the context of information that is conveyed by financial statements and information that is conveyed outside of financial statements:

> Although there seems to be considerable support for the view that reliability should be the dominant quality in the information conveyed in financial statements, even at the expense of relevance, while the opposite is true of information conveyed outside the financial statements, that view has in it the seeds of danger. Like most potentially harmful generalizations, it does contain a germ of truth: almost everyone agrees that criteria for formally recognizing elements in financial statements call for a minimum level or threshold of reliability of measurement that should be higher than is usually considered necessary for disclosing information outside financial statements. But the remainder of the proposition does not follow. If it were carried to its logical conclusion . . . the end would be that most really useful information provided by financial reporting would be conveyed outside the financial statements, while the audited financial statements would increasingly convey highly reliable but largely irrelevant, and thus useless, information (FASB, 1980).

Concepts Statement 2 rejects the view that reliability should be the dominant characteristic of financial statement information and suggests that relevance should have at least an equal standing.

3A.10 Difference between the FASB and the IASB Conceptual Frameworks with respect to Qualitative Characteristics

The differences between the FASB and the IASB Conceptual Framework with respect to qualitative characteristics are as follows:

Table 3.2: Difference between FASB and IASB Conceptual Frameworks

IASB	FASB
Understandability Relevance -Materiality Reliability -Faithful Representation -Substance over Form -Neutrality -Prudence -Completeness Comparability Constraints -Timeliness -Balance between Benefit and Cost -Balance between Qualitative Characteristics True and Fair View/Fair Presentation	Cost Benefit Constraint Understandability Decision Usefulness Relevance -Predictive Value -Feedback Value -Timeliness Reliability -Verifiability -Neutrality -Representational Faithfulness Comparability (Including Consistency) Materiality

3A.11 Updated IASB Conceptual Framework 2010

The International Accounting Standards Board (IASB) is currently in the process of updating its conceptual framework. The Board has undertaken the conceptual framework project to have a complete, comprehensive and single document called the *Conceptual Framework for Financial Reporting*. The version of the Conceptual Framework includes the first two chapters which the Board published in September 2010 as a result of its first phase of the conceptual framework project- Chapter 1 *The objective of financial reporting* and Chapter 3 *qualitative characteristics of useful financial information*. The updated Conceptual Framework for Financial Reporting 2010 has made a subtle change

in classifying the qualitative characteristics of useful financial information. A new Conceptual Framework for Financial Reporting, although in an incomplete shape, has been issued by the International Accounting Standards Board (IASB) in September 2010. Having a status of the constitution of a standard-setting body, this Conceptual Framework (CF) states the fundamental concepts in which the standards are rooted and that underlie the preparation of financial reports. This CF is to be used as a guide for developing future standards and reviewing existing standards. Due to a number of revised or new issues and as a component of authoritative guidance of the IASB in the absence of any standards or interpretations, this CF is of high importance for all the stakeholders of accounting and financial reporting. The IASB signed an agreement with the US FASB (the so-called Norwalk Agreement) in October 2002 stating that the two boards would seek to remove differences and converge on high-quality standards (Epstein & Jermakowicz, 2010: 9). At their joint meeting in October 2004, the IASB and the FASB decided to add to their respective agendas a joint project to develop a common conceptual framework, based on and built on both the existing IASB Framework and the FASB Conceptual Framework, that both Boards would use as a basis for their accounting standards (www.iasplus.com; accessed 21.04.2012). The objective of the conceptual framework project is "to develop an improved common conceptual framework that provides a sound foundation for developing future accounting standards" (IASB, 2010e). The Conceptual Framework project is being conducted in eight phases as follows: Phase A: Objective and qualitative characteristics; Phase B: Elements and recognition; Phase C: Measurement; Phase D: Reporting entity; Phase E: Presentation and disclosure; Phase F: Purpose and status of framework; Phase G: Applicability to not-for-profit entities; and Phase H: Other issues, if necessary. According to the discussion on the project plan, Phase A was expected to be completed by 2007, Phase B by 2008, Phase C by 2009, and Phases D to H by 2010.

Pounder (2010) observes that the concepts addressed by CFs tend to be "general in nature, broad in scope, and stable over time" to eliminate the need for a standards setter to reestablish core concepts each time it develops or updates a standard and hence,

> By consistently referring to a stable conceptual framework, a standards setter is more likely to promulgate standards that are consistent with each other as well as with significant assumptions and constraints.

The Conceptual Framework of the IASB shares this attribute in that it is rarely a focal point when analyzing financial statements and yet it is at the heart of every accounting standard ensuring consistency of terminology, recognition and measurement (Rodgers, 2007, 23). In accordance with Christensen (2010, 298), in the context of the demand for a CF from an information economics perspective, the focal point of the CF of financial reporting must also be the comparative advantage of accounting (which always produces information late in a decision process) over other, perhaps more timely, information sources. Having a status of the constitution of a standard-setting body, this Conceptual Framework (CF) states the fundamental concepts in which the standards are rooted and that underlie the preparation of financial reports. This CF is to be used as a guide for developing future standards and reviewing existing standards. Due to a number of revised or new issues and as a component of authoritative guidance of the IASB in the absence of any standards or interpretations, this CF is of high importance for all the stakeholders of accounting and financial reporting (Bala, S. K., 2012). Qualitative characteristics of useful financial information have been classified as follows:

Table 3.3: Qualitative characteristics of useful financial information

Fundamental qualitative characteristics (Para QC5-QC18)	**Enhancing qualitative characteristics (Para QC19-QC34)**
a) Relevance [*ingredients:* predictive value, confirmatory value, and materiality] b) Faithful representation [*ingredients: completeness*, *neutrality* and *free from error*] Applying the fundamental qualitative characteristics	a) Comparability b) Verifiability c) Timeliness and d) Understandability Applying the enhancing qualitative characteristics

Under the new Conceptual Framework, the qualitative characteristics of useful financial information apply to financial information provided in financial statements, as well as to financial information provided in other ways (QC3).

The Board has included materiality as an entity-specific aspect of relevance based on the nature or magnitude, or both, of the items to which the information relates in the context of an individual entity's financial report (QC11). The Board has replaced the 'Feedback value' of relevance with 'Confirmatory value'. According to QC7, financial information is capable of making a difference in decisions if it has predictive value, confirmatory value or both. According to QC12, to be a perfectly faithful representation, a *depiction* would have three characteristics. It would be *complete, neutral* and *free from error*. According to QC13,

> A complete depiction includes all information necessary for a user to understand the phenomena being depicted, including all necessary descriptions and explanations. For example, a complete depiction of a group of assets would include, at a minimum, a description of the nature of the assets in the group, a numerical depiction of all of the assets in the group, and a description of what the numerical depiction represents.

In this new Conceptual Framework, *faithful representation* means that financial information represents the substance of an economic phenomenon rather than merely representing its legal form. However, the replacement of the term Reliability by the term Faithful Representation has been considered sometimes as an important change to eliminate the possibility of a trade-off between relevance and reliability (Zhang, 2011: 13). Even there is criticism towards possible 'unreliable' implementation of some accounting measurements given the significant amount of subjective 'professional' judgment involved (Zhang, 2011, 17).

The old FASB Framework (1980) included the word *verifiability* as an aspect of reliability and according to it, information has the quality of reliability when it is free from material error and bias and can be depended upon by users to represent faithfully [para 31 of the Framework], although 'free from error' is often interpreted as 'verifiable'. Since including *verifiability* as an aspect of faithful representation could result in excluding information that is not readily verifiable (for example, expected cash flows, useful lives and salvage values). However, excluding information about those estimates would make the financial reports much less useful. Hence, verifiability is considered as

an enhancing qualitative characteristic, very desirable but not necessarily required [para BC3.36].

The *Conceptual Framework* defines neutrality as, "A neutral depiction is without bias in the selection or presentation of financial information." Neutrality does not mean that information does not favor any user of financial statements. Finally, free from error does not mean to say that reported information is accurate in every respect. The *Framework* comments in this respect, "Free from error means there are no errors or omissions in the description of the phenomenon, and the process used to produce the reported information has been selected and applied with no errors in the process." Instead of using the term 'Reliability' the Framework uses the term 'Faithful Representation'. Finally the Board emphasizes on the *cost constraint* that is a pervasive constraint on the information that can be provided by financial reporting. According to this updated *Conceptual Framework*, timeliness has been considered as one of the enhancing qualitative characteristics, which was previously treated as one of the components of relevance in the prior *Conceptual Framework*. The *Framework* considers understandability as the last 'Enhancing qualitative characteristics'. According to QC30, "Classifying, characterizing and presenting information clearly and concisely makes it understandable." Financial statements are prepared for the knowledgeable users The *Conceptual Framework*, in this regard, expresses in QC32, "Financial reports are prepared for users who have a reasonable knowledge of business and economic activities and who review and analyze the information diligently. At times, even well-informed and diligent users may need to seek the aid of an adviser to understand information about complex economic phenomena."

Summary of PART A

Two fundamental qualitative characteristics of accounting information deem important underlying in the IASB conceptual framework namely: faithful representation and relevance. Faithful representation comprises of completeness, neutrality and free from error whereas relevance includes predictive value, feedback value and materiality. There is also four qualitative characteristics of useful financial information that enhance faithful representation and relevance namely, comparability, verifiability, timeliness and understandability. Relevance is to be prioritized over reliability in practice but still information loses its value if either one is missing in a particular piece of information.

PART-B: Earnings Management

3B.1 Introduction

Earnings management is one of the most talked topics in the accounting world. Earnings mean the profits of a company which is represented by the bottom line of the income statement and a summary item in financial statements. Earnings are the vital item in financial statement because it represents to what extent the company engaged in value added activities. Earnings also indicate the signal of direct resource allocation in the capital market.

3B.2 Earnings Management- Meaning

Earnings management, in a nutshell, is the creative use of different accounting techniques to make financial statements look better. Earnings management is believed to be widespread. A 1990 report on earnings management situations stated that "short-term earnings are being managed in many, if not all companies", and in a 1998 speech, Securities and Exchange Commission (SEC) chairman Arthur Levitt called earnings management a "widespread, but too little-challenged custom". “Earnings management is the choice by a manager of accounting policies so as to achieve specific objective” (Scott, 2003, 369).

Earnings management should not be confused with illegal activities to manipulate the financial statements or reporting that do not reflect economic reality (which is commonly known as ‘cooking the books’. Earnings management may be defined as reasonable and legal management decision making and reporting intended to achieve stable and predictable financial results. A large number of companies are using earnings management either to maintain steady earnings growth or to avoid reporting red link. In other words, earnings management is a strategy used by the management of a company to deliberately manipulate the company’s earnings so that the figures match a predetermined target. This practice is carried out for the purpose of income smoothing. An accounting expert can manipulate earnings in several ways within the boundaries of accounting

standards. It can be said unethical but not always illegal. Earnings management is firms' strategic tool for maximizing firm value and reducing risks.

3B.3 Motivations behind Earnings Management

The reasons for Earnings management are diverse and range from the intention to satisfy analysts' expectations to incentives to realize bonuses or to maintain a competitive position within the financial market. Rahman et al. (2012) identified different categories of incentives: stock market incentives; signaling / concealing private information; political costs; personal interest; internal motives; management compensation contract motivations; lending contracts motivations and regulatory motivations.

i. Stock market incentives

   The interaction between accounting numbers and stock markets reaction can indeed push management towards earnings management. Investors often rely on the views and forecasts of stock market analysts to put together a portfolio of potentially successful firms. Meeting or beating the analysts' forecasts seems to be of enough importance for companies to engage in earnings management.

ii. Personal incentives

   There might be non-financial motives for the CEO to manage earnings. A new CEO can tend to downwards earnings management in the year of change and upwards earnings management in the following years.

iii. Signaling or concealing private information

   Failing firms engage in earnings management and alter their annual accounts to conceal their financial struggle without immediately measuring the consequences on stock price or CEO compensation. The growth signal combined with another signal such as a stock split might be an effective way of communicating private information.

iv. Political costs

Firms can also manage reported earnings by changing financial statements in order to influence shareholders' opinions and decisions. Governmental regulations and tax laws, when company makes use of financial reports, are obvious candidates to be analyzed as possible sources of earnings management motives. It can be valuable to companies to seem more/less profitable to escape from governmental interference.

v. Management compensation contract motivations

The management compensation theory, also known as the bonus plan hypothesis contends that managers are motivated to use earnings management to improve their compensation, as management bonuses are often tied to the firm's earnings. It is thus expected that earnings management is used to increase income. Managers are more likely to choose to report accruals that defer income when the cap on bonus awards were reached, as they had no more to gain from extra earnings and would be better off increasing income for the following year at that point.

vi. Lending contracts motivations

Another major hypothesis is the debt covenant hypothesis. This theory is based on the fact that creditors often impose restrictions on the payment of dividends, share buybacks and the issuing of additional debt in terms of reported accounting figures and ratios, in order to ensure the repayment of the firm's borrowings. Hence, the hypothesis is that firms who have a lot of debt have an incentive to manage earnings so that they do not breach their debt covenants.

vii. Regulatory motivations

Some industries, in particular the banking, insurance and utility industries are monitored for compliance with regulations linked to accounting figures and ratios. Banks and insurance firms especially are often subject to requirements that they have enough capital or assets to meet their liabilities. Such regulations may give managers incentives to use earnings management.

3B.4 Methods of Earnings Management

Earnings management is a very popular term used by management to manage earnings. The most successful and widely used earnings management techniques can be classified into twelve categories. The most common categories mentioned by Rahman, Moniruzzaman & Sharif (2012) are described below:

i. "Cookie jar reserve" technique

Under the cookie-jar technique, the entity will try to overestimate expenses during the current period to manage earnings. If and when actual expenses turn out lower than estimates, the difference can be put into the "cookie jar" to be used later when the company needs a boost in earnings to meet predictions. Some examples of estimation to manage earnings are: sales returns and allowances, estimates of bad debt and write-downs; estimating inventory write downs; estimating warranty costs; estimating pension expense; terminating pension plans and estimating percentage of completion for long term contracts etc.

ii. "Big bath" technique

Although a rare occurrence, sometimes corporations may restructure debt, write-down assets or change and even close down an operating segment. In these instances, expenses are generally unavoidable. If the management record estimated charge (a loss) against earnings for the cost of implementing the change then it will negatively affect the cost of the share price. But the share price may go up rapidly if the charge for restructuring and related operational changes is viewed as positively. According to Big bath technique, if the manager has to report bad news i.e., a loss from substantial restructuring, it is better to report it all at once and get it out of the way.

iii. "Big bet on the future" technique

When an acquisition occurs, the corporation acquiring the other is said to have made a big bet on the future. Under Generally Accepted Accounting Principles (GAAP) regulations, an acquisition must be reported as a purchase. This leaves two doors open for earnings management. In the first instance, a

company can write off continuing R&D costs against current earnings in the acquisition year, protecting future earnings from these charges. This means that when the costs are actually incurred in the future, they will not have to be reported and thus future earnings will receive a boost. The second method is to claim the earnings of the recently acquired entity. When the acquired entity consolidated with parent company earnings, then immediately receives a boost in the current year's earnings. By acquiring another company, the parent company buys a guaranteed boost in current or future earnings through big bet technique.

iv. "Flushing" the investment portfolio

A manager can manage its earnings through various techniques which are: a) timing sales of securities that have gained value: The company can sell a portfolio security that has an unrealized gain and can report the gain as operating earnings if it is required, b)Timing sales of securities that have lost value: If the manager wants to show lower earnings then he can sell the security that has an unrealized loss and report the loss in operating earnings, c) Change of holding intent, write-down "impaired securities: Management can manage earnings through change of its holdings from available to sale securities to trading securities and vice versa. This would have the effect of moving any unrealized gain or loss on the security to or from the income statement, d) Write-down "impaired securities: Securities that have an apparent long term decline in fair market value can be written down to the reduced value regardless of their portfolio classification.

v. "Throw out" a problem child:

To increase the earnings of future period, the company can sell the subsidiary which is not performed well i. e. "the problem child" subsidiary may be "thrown out". Earnings can be managed through sell the subsidiary, exchange the stock in an equity method subsidiary and spin off the subsidiary.

vi. Introducing new standard

Accounting principles can be modified in a way that will not change the earnings. When a new accounting standard is adopted it takes two to three

years to adopt the standard. Voluntary early adoption may provide an opportunity to manage the earnings.

vii. Write-off of long-term operating assets

Management has the discretionary power when selecting the write off method; write off period; estimating salvage value. It is not necessary to record depreciation or amortization expense if the long term operating asset changed to non operating asset.

viii. Sale/Leaseback

A company can enhance the earnings of the financial statement by selling a long term asset that has unrealized gain or losses. Moreover, by recording a gain or loss a company can manage its earnings. According to IAS 17, losses occurring in a sale/leaseback transactions are recognized on the seller's book immediately and gain are amortized over the period if it is capital lease or proportion of the payment is operating lease.

ix. Operating versus non-operating income

A company can take the advantage of managing earnings by changing the time of an accrual basis rather than cash basis. Moreover, timely adoption of a better revenue recognition rule will provide a new window to manage the earnings.

x. Early retirement of debt

Management can manage the earnings by selecting the fiscal period of early retirement of debt. A gain or loss is occurred when the company makes the early payment of cash which is different from the book value of long term debt such as bonds. This gain or loss is recorded as an extraordinary item at the bottom of the income statement which will boost up the earnings of that period.

xi. Use of derivatives

Derivatives offer a lot of opportunities for manager to manage earnings. Derivatives can be used to protect against some types of business risk, such as: interest rate changes; commodity price change; oil price changes; changes in foreign currency exchange rates etc. Derivatives should be reported as

assets and liabilities in the balance sheet and measured at fair value. Gains and losses from derivate transactions are generally recognized immediately in regular income. When the company enters into the swap is up to the company, the timing option provides an opportunity to manage the earnings.

xii. Shrink the ship

Companies do not have to report any gain or loss for repurchase of their own shares on the income statement because no income is recognized on the transaction. Income is only earned through equity transactions outside the firm, not with those involving the firm's owners. A stock buy does not affect earnings but it is used to affect earnings per share. So, this is a common & popular earnings management technique.

3B.5 Detecting Earnings Management

Earnings management may be difficult for individual investors to detect due to the complexity of accounting rules, although accounting researchers have proposed several methods. For example, research has shown that firms with large accruals and weak governance structures are more likely to be engaging in earnings management. Since earnings are composed of cash flow from operations and accruals, firms have two options to manage earnings. First, firms can manage earnings through deviation from the normal business operations, so that the cash flow from operations will be affected. Deviating from normal business practices to manipulate reported income is defined as real earnings management (REM) (Roychowdhury 2006). Second, a firm can alter the level of accruals to obtain the desired level of earnings. Managers use judgments in financial reporting which can be defined as accrual-based earnings management (Healy and Wahlen 1998). To measure actual-based earnings management, there are several models that have been developed so far. Out of these models, modified Jones model is the most effective model. Extended modified Jones model works better in context of Bangladesh.

Summary of PART B

To sum up the discussions, Modified Jones model and extended modified Jones model are best suited to detect accrual-based earnings management. A modified version of the Jones Model is considered in the empirical analysis. The modification is designed to eliminate the conjectured tendency of the Jones Model to measure discretionary accruals with error when discretion is exercised over revenues. The modified Jones model is extended by incorporating few additional variables such as depreciation expense, bad debt expense, retirement benefit expense and current period expense. Such extended modified Jones model proves effective in the developing particularly Asian countries like Korea and Bangladesh.

Chapter 4

A SURVEY OF RELATED LITERATURE

A SURVEY OF RELATED LITERATURE

4.1 Survey of Related Literature

The ERP systems implementation is expensive and time consuming as well. ERP systems, sold by vendors such as SAP AG and Oracle Corporation, on average, cost US$15 million and implementations take, average 21 months to complete (O'Leary, 2000). Over the past decade, corporations have experienced both successful and unsuccessful ERP implementations, and the benefits, complexities, and risks of ERP systems have been documented in the popular press (e.g., Bartholomew, 1997).

Empirical research related to ERP systems implementations can be divided into four research streams. First, studies have identified key success factors that are critical to the successful adoption of ERP systems. Critical success factors are ERP team composition, and changing management culture (Nah et al., 2001); executive commitment and change management (Stratman and Roth, 2002). Bradford and Florin (2003) find out Diffusion of Innovation and Information Systems Success theories to determine that the level of employee training in the ERP systems and competitive pressure to adopt the systems positively impact implementation performance. Koh et al. (2006) examine enterprise resource adoption in Greek companies (Fragmented ERP adoption), where the internal enterprise's culture, resources available, skills of employees, and the way ERP systems are perceived, treated and integrated within the business and in the supply chain, play critical roles in determining the success/failure of ERP systems adoption. Umble et al. (2003) identified success factors, software selection steps, and implementation procedures critical to a successful implementation through a case study of a successful ERP implementation. They have explored nine critical success factors such as clear understanding of strategic goals, commitment by top management, excellent project management, organizational change management, a great implementation team, data accuracy, extensive education and training, focused performance measures, multi-site issues etc and found that non-financial benefits of ERP implementation is the most . Genoulaz et al. (2005) also focused on the implementation steps and optimization of ERP

through case studies. Their survey confirms that the research on ERP system is still a growing field but has reached some sort of maturity. The authors notice a growing interest on the post-implementation phase of the projects, customization of ERP systems, the sociological aspects of the implementation, the interoperability of the ERP with other systems and the return on investment of the implementation. Supramanium and Kuppusamy (2009) conducted a comprehensive study to identify the critical success factors and key benefits of ERP implementation in Malaysian perspective and identified top management support, use of consultant and project management approach as the top three critical success factors. Sanchez and Bernal (2007) focuses on seeking the most important critical success factors (CSF) that influence the implementation process of an Enterprise Planning System based on literature review in Mexican context. They have identified a reference list of fourteen CSFs namely, top management support, business process reengineering, project management, project champion, end users involvement, training and support for users, having external consultants, change management plan, ERP system selection, vision statement and adequate business plan, to facilitate of changes in the organizational structure in the "legacy systems" and in the IT infrastructure. Communication, teamwork composition for the ERP project, tests and, problem solutions. It is evident from the researches; top management support is the most important critical success factor for successful ERP implementation in any enterprise.

A second stream suggests that the market positively reacts to ERP systems adoption announcements and deems their implementation as an addition to the market value of the firm. Hayes et al.'s (2001) archival results show a positive standard cumulative abnormal return for a sample of ERP systems adoption announcements. Hunton et al. (2002), using experimental methods, find analysts positively revise their earnings forecasts after receiving ERP adoption announcements. Mabert et al. (2000) found that Companies that started their implementations later tended to have shorter completion times and smaller budgets, reflecting that implementations have become more efficient over time because of the learning curve effect.

Sehgal et al. (2012) examines the persistence of earnings performance, the contribution of accruals and cash flows in the persistence of earnings and whether investors correctly value the information contained in earnings, accruals and cash flows for equity pricing.
Hitt et al. (2002) explores that ERP software integrates key business and management processes within and beyond a firm's boundary. It is found that larger firms tend to invest in ERP.

Third, research studies have investigated whether the implementation of an ERP systems result in improved operational performance. These studies, using accounting-based performance measures (e.g., financial ratios), have generally found mixed results related to the relation between ERP adoption and post-implementation firm performance (e.g., Poston and Grabski, 2001; Hitt et al., 2002). However, researchers find that positive relationship become more evident when adopters are compared to non-adopters. Hunton et al. (2003) and adopters use non-financial performance incentives (e.g., products or facilities) in executive compensation contracts (Wier et al., 2005). Hunton et al. (2001) examines the longitudinal impact of ERP adoption on firm performance with the help of developing three hypotheses such as H1: Longitudinal financial performance of firms that have not adopted ERP systems will be significantly lower than ERP-adopting firms; H2a: For relatively large ERP-adopting firms, there will be a significant negative association between firm health and performance;H2b: For relatively small ERP-adopting firms, there will be a significant positive association between firm health and performance. Hitt et al. (2002) showed that ERP software integrates key business and management processes within and beyond a firm's boundary. It is found that larger firms tend to invest in ERP. Hunton et al. (2004) examine the extent to which financial auditors recognize potential differences in business, security and audit risks between non-ERP (Legacy) and ERP computing systems in light of relatively weak security controls. Alzoubi (2011) identifies the effectiveness of accounting information system for companies adopting ERP and its relationship with the quality of accounting outputs and the internal control.
Fourth, studies relate to the effects of ERP systems implementation such as the effects of ERP systems on earnings management and management of earnings release dates (Brazel and Dang, 2008) Which is supported by Chai and Tung, their study examines whether

firms releasing earnings reports later than expected engage in earnings management; the effects of ERP systems implementation on the usefulness of accounting information (Brazel and Dang, 2005). Brazel and Dang (2005) empirically find that ERP systems adoption increases the management discretion to manage accruals i.e., reliability (Representational faithfulness) of accounting information is decreased. They also find a positive relationship between ERP implementations and decrease in reporting lag i.e., relevancy of accounting information is positively affected. They measured reliability of accounting information in terms of one component i.e. representational faithfulness and relevance in terms of one component i.e. timeliness of reporting. Other components of reliability and relevance of accounting information are not taken into consideration in the prior study. Thus a logical extension of extant research is to investigate how ERP systems implementations affect the primary qualities of financial accounting information – reliability and relevance considering all the components. Brazel and Dang (2005) empirically proved that reliability in terms of representational faithfulness decreases as managers get the unprecedented opportunity of access to information and throughout the year they can apply their discretion to manage earnings. Moreover, internal control mechanisms and audit function are two means of controlling such discretion. But ERP systems implementations also reduce the effectiveness of these two mechanisms. Financial audit and internal controls are two means in which the managerial opportunities to manipulate the numbers are kept in check and thus provide financial statements to external users that are representationally faithful and reliable. Hogan and Wilkins (2005) find that, even in case of firms with internal control weaknesses, the audit function appears to constrain potential earnings management. Also, internal controls over financial reporting are defined as "a process… to provide reasonable assurance regarding the reliability of financial reporting" (PCAOB, 2004, A-93). Following an ERP systems implementation, the ability for firms to manage earnings to meet incentives may increase due to enhanced information access and reductions in the safeguards of audit quality and internal control effectiveness. The expectation that the presence of incentives and increased opportunities results in otherwise managers becoming involved in financial statement management is consistent with the fraud triangle (AICPA, 2002) and appears to be an accounting application of Wilson and Kelling's (1982) Broken Windows Theory.

The fraud triangle includes: incentives/pressure, opportunity and rationalization/attitude. The Broken Window Theory suggests that the impetus to engage in certain inappropriate behavior does not come from a certain personality type, but rather when environmental features allow such behavior (e.g., broken windows not fixed). Recent research indicates that there may be reductions in internal control effectiveness and audit quality in ERP settings (Wright and Wright, 2002; Hunton et al., 2004; Brazel and Agoglia, 2005). Such combination of increased managerial access to information/discretion over accounting information and weak internal control/poor audit quality will create an avenue for the managers to manipulate the accounting numbers. Dechow (1995) considers potential misspecifications in tests for earnings management with the help of cross-sectional Modified Jones Model and their impact on inferences concerning earnings management. He finally finds that the modified Jones Model is the effective tool to determine the reliability of accounting information as compared with other models. Cocker (2005) examines the trade-off between reliability and relevance of accounting information and concludes that there is not a relationship between reliability and relevance. Amoah et al. examine the relation between internal control material weakness under section 404 of US SOX Act 2002 and real earnings manipulation and explore that there is a positive relation between internal control material weakness and abnormal production cost. This finding is supported by Doyle, Ge and McVay (2007) who basically identify the determinants of weakness in internal control system. Chen et al. (2012) examine the impact of ERP implementations on the role of accountants. It is seen that after ERP implementation, the role of non-managerial accountants does not change as much as that of managerial accountants, leader of the e-business project, does. Finally, Riccio (2000) finds that the implementation of ERP provoked a group of changes that altered the way of operation of accounting. The changes are considered beneficial by the accountants.

The other chief benefit of ERP systems implementation cited by Poston and Grabski (2001) is improved efficiencies through computerization. From the perspectives of financial accounting information, this implies a reduction in the financial reporting cycle for ERP systems adopters. Anecdotal evidences and surveys of ERP adopters suggest that ERP systems reduce reporting lags by processing business transactions more efficiently

and reducing the financial close cycle (e.g., Mabert et al., 2000; Wah, 2000; Hitt et al., 2002) Studies examining the timeliness of earnings indicate that firms publish financial reports earlier when they have 'good news'. Givoly and Palmon (1982) define 'good' and 'bad news' via an earnings expectation model and their results suggest 'bad news' reports tended to be delayed. Han and Wild (1997) investigate and find that timely disclosures of 'good news' firms have negative implication for their competitors. Graham et al. (2004) and Bagnoli et al. (2005) find recent evidence that suggests firms intentionally delay releasing bad news to investors until after trading hours or until later in the week. Prior studies examine the fact that ERP implementations could shorten the time lag between accounting year-end and earnings release date. Anecdotal evidence suggests that ERP systems adoption can positively affect the timeliness or relevancy of financial accounting information through decreasing the financial close cycle (e.g., Brown 1997; Jensen and Johnson, 1999; Wah, 2000; Brazel and Dang, 2005). A single study is so far found on all the three components of relevance of accounting information i.e., timeliness, feedback value and predictive value of information (O. F. Attayah & I. M. Sweiti, 2007). Attayah & Sweiti (2007) examinee the impact of ERP system on the usefulness of accounting information which covers the timeliness, predictive value and feedback value of the accounting information. They find that ERP use increases the relevance of information with respect to timeliness, predictive value and feedback value. This is supported by Shafakheibari and Oladi (2015). They have conducted the research to evaluate the effect of implementing ERP systems on relevance of accounting data, the subsequent effect of accounting data relevance with a special emphasis on timing and finally on financial reporting quality with a special emphasis on the quality of accruals.

Researchers found it arduous and challenging to detect or measure earnings management. It is not possible to observe earnings management directly. Therefore, researchers have investigated two venues for earnings management, the choice of accounting methods and the management of accruals. Past research in their attempt to study accruals use two models: Healy (1985) and DeAngelo (1986) use total accruals as a proxy for earnings management while Jones (1991), Dechow, Sloan and Sweeney (1995), Rangan (1998), Teoh et al. (1998a) and Teoh et al. (1998b) use discretionary accruals.

An abundance of literature has surfaced in the area of earnings management. Potential earnings management has become a concern throughout the world. Earnings management occurs when managers use judgment in financial reporting and in structuring transactions to alter financial reports. The objective is to either mislead some stakeholders about the underlying economic performance of the company or to influence contractual outcomes that depend on reported accounting numbers (Healy and Wahlen, 1999). Many studies have examined management's choice of accounting methods, while other research has studied accrual management. As stipulated under Generally Accepted Accounting Principles (GAAP), managers may choose among various accounting policies that affect reported income differently. Most past researches were carried out in the United States market and some of them are described in the following sections. According to Cormier and Magnan (1996), research supports the economic and financial theory assumption that managers make accounting choices to maximize their personal interests and well-being. An accounting choice that is economically beneficial for managers will be preferred to manage earnings because they generally do not require disclosure and often will not be questioned by an auditor.

Schipper (1989) defines earnings management as 'a purposeful intervention in the external financial reporting process with the intention of obtaining some private gains'. As DuCharme et al. (2000) point out, pure earnings management techniques available to managers tend to fall within three broad categories: choice of accounting methods, revision of estimates and acceleration of deferral of revenues and expenses. At any point of time, some of the firm's future revenues and costs are genuinely uncertain and while no set of hard and fast rules can help to solve it and inevitably, there are instances where firm exercise judgment and thus opens room for firms to manage earnings. It is not surprising that managers, in their judgment, believe that they are acting in the firm's best interest. In particular, without violating accounting rules, firms can accelerate the recognition of revenues and defer the recognition of certain expenses under business environment.

Economic and financial theory assumes that managers are, by nature, rational and opportunistic in the pursuit of their personal interests (Cormier and Magnan, 1996). These interests are determined by the terms set out in contracts between managers and the company, as well as in contracts between the company and specific external parties such as suppliers, lenders, governments and regulators. Many of these contracts are based on earnings or other financial information issued by the company. For example, senior executives often receive bonuses based on accounting income; and debt often has covenants that state minimum working capital amounts, establish maximum debt-to-equity ratios or restrict dividends based on the amount of retained earnings. An accounting choice that is economically beneficial for managers will be preferred over a choice with negative repercussions: it is assumed that the manager will adopt a "strategic" approach in his or her accounting choices. The study of the effect of contract terms on accounting choices is known as contracting theory or positive accounting theory.

Initial studies based on this theory focused on the reasons that motivate managers for choosing accounting policies. Such policies include capitalizing versus expensing interest payments, using accelerated depreciation rather than the straight-line method, and deciding on whether to capitalize research and development costs. In general, research supports the assumption that managers make accounting choices to maximize their personal interests and well-being.

However, examining accounting policy choices tells only part of the story. Researchers have come to realize that (1) firms do not and cannot constantly change accounting policies; (2) managers do not choose an accounting policy without considering the firm's accounting procedures "portfolio"; and (3) earnings according to generally accepted accounting principles (GAAP) may be influenced by factors other than the choice of accounting policy. These limits have led researchers to examine whether managers use accruals (the difference between net earnings and cash flow) to accomplish their interests. This approach seems logical: accruals represent the overall measurement of a firm's accounting disclosure policy, and they are more likely to reflect a strategic decision made

by the firm's managers than simply the study of a particular accounting choice. Accruals are also an attractive way for managers to manage earnings because they generally do not require disclosure and often will not be questioned by an auditor. It's important to note that earnings management is not the same as earnings manipulation. Earnings management, however, complies with GAAP whereas earnings manipulation does not.

Neill, Pourciau and Schaefer (1995) report that, proceeds from the initial offering of IPO using income-increasing (liberal), for example borrowing aggressively from future earnings, are relatively higher than those using income-decreasing (conservative) methods when analyzing accounting method choice. Thus, there is incentive for issuing firms to manage earnings to raise enough capital when the investors foresee the share price to increase. In addition, managers personally can earn abnormal profits when they sell their shares. Managers attempt to manipulate earnings in order to influence short-term stock price performance and also for job security. However, aggressive management of earnings through income-increasing accounting adjustments leads investors to be overly optimistic about the issuer's prospect and thus overvalues the new issues (Abdullah et al., 2004). When these high pre-issue earnings are not sustained over time, disappointed investors subsequently will devalue the firm. Inevitably, according to Rangan (1998), managers will continue to manage earnings in the subsequent two quarters after the offering announcement for two reasons:

1. An earnings reversal immediately after the offering and the associated price drop could invite lawsuits against the firm and its manager.
2. Firms enter into lock-up agreements with their underwriters that prevent insiders at issuing firms from selling their holdings until 90 to 180 days after the offering date.

Yoon et al. (2006) and Islam et al. (2011) evidenced that modified Jones model is effective in the context of Asian countries like Korea and Bangladesh when the model incorporates few additional variables in the model namely current period expenses, trade accounts payable at year-end, depreciation expense, and retirement benefits expense. The inclusion of these few variables significantly increased the explanatory power in detecting earning management.

Summary of Literature Review

Authors	Study period	Hypothesis tested	Methodology	Major findings	Issue covered	Limitations	References
Joseph F. Brazel and Li Dang	1994 to 1999	H1: ERP system implementations decrease the reliability of accounting information. H2: ERP system implementations increase the relevancy of accounting information for "Good news" firms. H3a: The extent of ERP system implementations are negatively related to the reliability of accounting information. H3b: The extent of ERP system implementations are positively related to the relevancy of accounting information for "good news" firms.	**Sample size:** 625 unique firms from manufacturing and service industries **Statistical tools used:** Cross-sectional modified Jones model has been applied to test the discretionary accruals (reliability of accounting information), where a regression model is developed. Again regression analysis is used covering panel data to test accounting information relevancy.	H1 and H2 are supported but H3a and H3b are not supported.	Representational faithfulness of reliability and timeliness of relevancy of accounting information has been covered under the study.	Only a single component each from reliability and relevancy of accounting information is tested.	Brazel, J. F. and L. Dang. 2005. The effect of ERP system implementations on the usefulness of accounting information.
Joseph F. Brazel and Li Dang	1993 to 1999	H1: ERP system implementations lead to increases in earnings management. H2: ERP system implementations shorten reporting lags for "good news" firms. H3a: The extent of ERP system implementation is positively related to the extent of earnings management. H3b: The extent	**Sample size:** 625 unique firms from manufacturing and service industries **Statistical tools used:** The cross-sectional modified Jones model has been used to measure discretionary accruals (earnings management).	H1, H2, H3a are supported but H3b is not supported.	The absolute value of discretionary accruals and reporting lag between the firm's actual earnings announcement date and fiscal year-end has been covered under the study.	a) There might be a selection bias as all the data have been collected from a single source. b) The authors rely on prior research indicating that the safeguards of audit and internal control may have been suspect, which may improve	Brazel, J. F. and L. Dang. 2008. The effect of ERP system implementations on the management of earnings and earnings release dates. *Journal of Information Systems*, 22 (2): 1-21.

		ERP implementation is negatively related to reporting lags for "good news" firms.	Multivariate regression analysis has been performed to measure earnings release date management.			over time. c) If managers may use more discretion over accounting information, the data used in the study may be suspect.	
V. Botta-Genoulaz, P.-A. Millet and B. Grabot	2003 and 2004	Qualitative research	A survey on the recent research literature on ERP systems followed by case studies.	The survey confirms that the research on ERP system is still a growing field but has reached some sort of maturity. The authors notice a growing interest on the post-implementation phase of the projects, customization of ERP systems, the sociological aspects of the implementation, the interoperability of the ERP with other systems and the return on investment of the implementation.	Implementation of ERP, optimization of ERP, management through ERP, the ERP software, ERP for supply chain management, case studies.		B.-Genoulaz, P.-A. Millet, and B. Grabot. 2005. A survey on the recent research literature on ERP systems. *Computers in Industry* 56:510-522.
Abhijit Barua	1988 to 2003	H1a: Earnings response coefficients (ERCs) are	**Sample size:** 24,384 firm-year observations	H1a is not supported but H1b	Feedback value, predictive value and	Earnings quality may have a substantial	http://etd.lsu.edu/docs/available/etd-

		significantly higher in portfolios of firms with high quality earnings compared to firms with low quality earnings. H1b: Explanatory powers of earnings to explain market price are significantly higher portfolios of firms with high quality earnings compared to firms with low quality earnings. H2a: ERCs are significantly different between the portfolio of firms with high relevant and low reliable versus low relevant and high reliable earnings. H2b: Explanatory powers of earnings to explain market price are significantly different between the portfolios of firms with high relevant and low reliable earnings versus low relevant and high reliable earnings.	**Statistical tools used:** Regression and factor analysis.	and H2a and H2b are supported	timeliness of relevance are covered and representational faithfulness, verifiability and neutrality of reliability are covered.	effect on the overall information quality of firms, which is not considered in this study.	03172006-101515/unrestricted/Barua_dis.pdf
Mahadevan Supramanium and Mudiarasan Kuppusamy	2009	None as it is the exploratory research	**Sample size:** 151 sample firms **Statistical tools used:** Descriptive statistics and a one-sample t-test	The research findings are presented and discussed in two categories. The first category discussed	Critical success factors and key benefits of ERP implementation in Malaysia	Risk management in ERP implantation has not been considered.	Supramanium, M. and Kuppusamy, M. 2010, ERP system implementation: A Malaysian Perspective, *Journal of Information Technology Management,*

				about the critical success factors in ERP implementation and the second one presents the benefits achieved from the ERP implementation.			pp 35-48.
L. TaeHyung, Y. Moon and L. Heeseok	2004	Survey based research	**Sample size:** 131 respondent firms **Statistical tools used:** Descriptive statistics	All three countries' firms indicated that the most important motivations for implementing ERP systems were 'simplify standardize systems' and 'replace legacy systems.' The Korean and US firms preferred a single package with other systems.	Determining the extent of adoption of the ERP system in the Korean manufacturing firms.	Objective comparison purposes, timing and extent of the study is not always comparable with US and Swedish firms. More in-depth analysis on the relationship between individual parameters may be useful in the future. The industry sector may be extended beyond manufacturing.	L. TaeHyung et.al. 2006. Enterprise resource planning survey of Korean manufacturing firms, *Mechanical and Aerospace Engineering.*
E. J. Umble, R. R. Haft and M. Michael Umble		Qualitative research			Implementation steps and critical success factors of ERP implementation		E. J. Umble et. Al. 2003. Enterprise resource planning: Implementation procedures and critical success factors, *European*

							Journal of Operational Research 146, 241-257.
James E. Hunton, B. Lippincott and J.L. Reck	2001	H1: Longitudinal financial performance of firms that have not adopted ERP systems will be significantly lower than ERP-adopting firms. H2a: For relatively large ERP-adopting firms, there will be a significant negative association between firm health and performance. H2b: For relatively small ERP-adopting firms, there will be a significant positive association between firm health and performance.	**Sample size:** 63 firms **Statistical tools used:** Descriptive statistics and non parametric Wilcoxon test	H1 is partially supported and H2a and H2b are fully supported	The longitudinal impact of ERP adoption on firm performance	The researchers did not directly test whether ERP gains are being transferred to customers	James E. Hunton et.al. 2003. Enterprise resource planning systems: comparing firm performance of adopters and nonadopters, *International Journal of Accounting Sysems 4*
Patricia M. Dechow, Richard G. Sloan and A. P Sweeney	Five different model from different years	Problem 1: Incorrectly attributing earnings management to PART. Problem 2: Unintentionally extracting earnings management caused by PART Problem 3: Low power test	**Sample size:** **(i)** Samples of 1000 firm-years that are randomly selected from pools of firm-years experiencing extreme financial performance; (ii) samples of 1000 randomly selected firm-years in which a fixed and known amount of accrual manipulation has been		This considers potential misspecifications in tests for earnings management and their impact on inferences concerning earnings management.	First, regardless of the model used to detect earnings management, the power of the tests is relatively low for earnings management of economically plausible magnitudes. Finally, it is important to consider the relation between the context in which earnings management is	P. M. Dechow, R. G. Sloan A. P Sweeney. 1995. Detecting Earnings Management, *The Accounting Review* Vol. 70, No. 2.

			artificially introduced; and (iii) a sample of 32 firms that are subject to SEC enforcement actions for allegedly overstating annual earnings in 56 firm-years. **Statistical tools used:** Multiple Regression			hypothesized and the model of nondiscretionary accruals that is employed, because the model of nondiscretionary accruals may unintentionally extract the discretionary component of accruals.	
Antoinette L. Cocker	2002	H0: There is not a relationship between relevance and reliability. H1: There is a relationship between relevance and reliability.	**Sample size:** 228 participants from three interest groups; debt providers, equity providers, and statement preparers **Statistical tools used:** Kendall's Tau correlation coefficients	H1 is supported	Reliability and relevance of accounting information are covered in this study.	Firstly, the statistical technique used in this research requires randomly selected participants and this assumption was compromised when the sample was established. Secondly, all the asset classifications used were not appropriate for the entire sample. Thirdly, there is the possibility of a non-response bias occurring in the sample.	A dissertation submitted in partial completion of the requirements of the degree of Bachelor of Commerce (Honours) at the University of Otago, Dunedin, New Zealand, October, 2005
N.Y. Amoah, I. Bonaparte and A. P. Tang	2004 to 2011	H1: Ceteris paribus, there is a negative relation between internal control material weakness (ICMW) and abnormal cash flow from operations.	**Sample size:** 1824 firm observations **Statistical tools used:** Descriptive statistics and regression models	H1 and H2 are supported	The relation between internal control material weakness under section 404 of SOX and real earnings	Non-manufacturing firms are not taken into account. Future studies could also examine whether the severity of the	http://sfm.finance.nsysu.edu.tw/pdf/2014pdf/004-1778011221.pdf

		H2: Ceteris Paribus, there is a positive relation between internal control material weakness and abnormal production cost. Ceteris Paribus, there is a negative relation between internal control material weakness and abnormal discretionary expenses.			manipulation is explored in the study.	ICMW is associated with the level of real earnings manipulation.	
Yong Yu	1988 to 2002	Three features of Sloan's (1996) research design affecting inferences regarding existence of accrual anomaly are examined: omission of cash flows, the use of an annual setting, and reliance on the full sample of firms.	**Sample size:** 25,540 firm – years **Statistical tools used:** Descriptive statistics and correlation	Accruals are found to be positively associated with subsequent returns. When cash flows are omitted, there is a severe downward bias on the association between accruals and subsequent returns. Finally, financial analysts are found to underreact to accruals.	The accrual anomaly is reexamined.	The investigation of possible explanations for what appears to be an under reaction to accruals and cash flows represents fertile avenues for further work aimed at understanding how investors value accruals and cash flows,	The paper is based on the dissertation of the author at Pennsylvania State University, December 30, 2005
Mary L. Chai and Samuel Tung	1991 to 1994	H1: Firms that delay their earnings announcements in a given year will exhibit negative abnormal accruals in that year. H2:The magnitude of income-decreasing	**Sample Size:** 2,045 firm-year observations with late annual earnings and 8,458 firm-year observations with non-late annual	The results are consistent with the hypothesis.	The study examines whether firms releasing earnings reports later than expected engage in earnings management	Not available	"The effect of Earnings-Announcement Timing on Earnings Management" published as Business Research Centre Working Papers at Hong Kong Baptist

		abnormal accruals is positively related to the reporting lag.	announcements. **Statistical tools used:** Descriptive Statistics and multivariate regression using regression.		.		University.
Daniel W.Collins and Paul Hribar	1988 to 1997	Exploratory in nature	**Sample Size:** 14,558 firm-years		The paper examines the impact of measuring accruals as the change in successive balance sheet accounts, as opposed to measuring accruals directly from the statement of cash flows.	Not available	tippie.uiowa.edu/accounting/mcgladrey/workingpapers/00-07.pdf
V. A. Mabert, A. Soni and M.A. Venkataramanan	2000	Case study and questionnaire based	**Sample Size:** 78 Sample firms **Statistical Tools used:** Logistic regression	Companies that started their implementations later tended to have shorter completion times and smaller budgets, reflecting that implementations have become more efficient over time because of the learning curve effect.	The paper empirically investigates key differences in the approaches used by companies that managed their implementations on time and on budget versus that did not using data collected through a survey.	The research to find answers to complex processes often creates new questions. The authors note some counter-intuitive outcomes that require future explorations.	V. A. Mabert, A. Soni and M.A. Venkataramanan2003. Enterprise Resource Planning: Managing the implementation process. *European Journal of Operational Research 146*. 302-314
O. F. Attayah & I. M. Sweiti	2007	H0: There are no significant	**Sample size:** 69 ERP	Null hypothesis	The present study aims	Not available	Attayah O. F. & I. M. Sweiti.

		differences in relevance of accounting information due to the use of ERP system. Sub hypotheses are: H1: There are no significant differences in predictive value of accounting information due to the use of ERP system. H2: There are no significant differences in timeliness of accounting information due to the use of ERP system. H3: There are no significant differences in feedback value of accounting information due to the use of ERP system.	adopters and 21 non ERP-adopters **Statistical tools used:** Descriptive statistics and independent sample test	is rejected i.e., ERP use increases the relevance of information with respect to timeliness, predictive value and feedback value.	at examining the impact of ERP system on the usefulness of accounting information which covers the timeliness, predictive value and feedback value of the accounting information		2014, Impact of ERP system using on the Accounting Information Relevance: Evidence from the Saudi Arabia. *Journal on Business Review* Vol. 3 No. 2.
O. M. Tijani and M. G. Ogundeji		H1: Adoption of ERP systems has no significant impacts on financial transactions processing. H2: There are no significant improvements in accounting information systems subsequent to the adoption of ERP systems.	**Sample size:** Forty respondents **Statistical tools used:** ANOVA and correlation	H1 and H2 are supported.	ERP systems implementation has impact on financial transaction processing and significant improvements in accounting	Not available	Tijani O. M. and M. G. Ogundeji.2014. Enterprise Resource Planning Systems Implementation : Effects on Accounting Information Processing. *Advances in Economics and Business 2 (2).*
J. F. Brazel and C. P. Agoglia	2004	H1: The difference between high-and low-AIS expertise auditors' control risk assessments	**Sample size:** 71 professional accountants **Statistical tools used:**	H1 is not supported but H2 is supported	The study investigates the effects of computer assurance specialist	Future research could investigate the relationship between the complexity	J. F. Brazel and C. P. Agoglia. 2005. An examination of auditor planning

		will be greater when CAS competence is low than when it is high. H2: The difference between high-and low AIS expertise auditors' scope of planned substantive audit procedures will be greater when CAS competence is low than when it is high.	MANOVA		(CAS) competence and auditor accounting information system (AIS) expertise on auditor planning judgments in a complex AIS environment.	level of corporations' AIS and measures of audit quality. Future research could consider the implications for audit efficiency and effectiveness of either allocating additional internal control testing to CAS or providing auditors with greater training in evaluating IT risks.	judgments in a complex AIS environment: The moderating role of auditor AIS expertise. Working paper, North Carolina State University.
J. Doyle, W. Ge and S. McVay	August 2002 to 2005	H1: Firm size is a determinant of good internal control. H2: It is expected to find fewer control weaknesses in older firms. H3: Poorly performing firms may not be able to adequately invest time and money in proper controls. H4: The need for internal controls is unique to each firm's particular operating environment. H5: A quickly growing firm may outgrow any internal controls it has in place, and may require time to establish new procedures.	**Sample size:** 779 material weakness firms **Statistical Tools used:** Descriptive statistics and univariate analysis, logistic regression	The results are consistent with the hypotheses.	The determinants of weaknesses in internal control is examined.	A potential limitation of this study is the short time frame over which the data is gathered. It is possible that some firms did not discover or disclose their material weaknesses.	Doyle, J., et al., 2007. Determinants of weaknesses in internal control over financial reporting. *Journal of Accounting and Economics.*
H. J. Chen, S. Y. Huang, A. A. Chiu and F.	2004	Case study and questionnaire	**Sample size:** Shanghai Financial	After ERP implementation, the	The impact of ERP implementat	Future study may expand the sampling	H. J. Chen, S. Y. Huang, A. A. Chiu and F.

C. Pai.			Center (SFC) and region businesses in Mainland China and Taiwan areas. **Statistical tools used:** T-test	role of non-managerial accountants does not change as much as that of managerial accountants, leader of the e-business project, does.	ions on the role of accountants has been examined.	scope and compare the difference in different industries and region.	C. Pai. 2012. The ERP system impact on the role of accountants. *Industrial Management & Data Systems*.
N. Shaakheibari and B. Oladi	1987 to 1991	There is a positive and significant relationship between the implementation of ERP and relevance of accounting data and a negative relationship between relevance of accounting data and quality of financial reporting.	**Sampling size:** Companies enlisted with Tehran Stock Exchange **Statistical tools used:** Descriptive statistics and regression model	Results are consistent with the hypotheses.	The research has been conducted to evaluate the effect of implementing ERP systems on relevance of accounting data, the subsequent effect of accounting data relevance with a special emphasis on timing and finally on financial reporting quality with a special emphasis on the quality of accruals.	Not available	N. Shaakheibari and B. Oladi. 2015. The effect of ERP system on relevance of accounting data and quality of financial reporting quality. *Management and Administrative Science Review*. Vol. 4, Issue 3.
Ali Alzoubi		H1: Enterprise Resource Planning system improves the quality of accounting information systems outputs. H2: Enterprise Resource Planning system improves the internal control of the accounting	**Sample Size:** 28 respondent companies located at Al Hassan Qualified Industrial Zone **Statistical tools used:** Ks test and t-test	Results are consistent with the hypotheses.	The study aimed at identifying the effectiveness of accounting information system for companies adopting ERP and its relationship with the	Not available	Ali Alzoubi. 2011. The effectiveness of the accounting information system under the enterprise resource planning. *Research Journal of Finance and Accounting*. Vol. 2, No. 11.

		information systems.			quality of accounting outputs and the internal control.		
Edson Luiz Riccio	2000	Case study based	**Sample size:** 7 respondent companies	The implementation of ERP provoked a group of changes that altered the way of operation of accounting. The changes are considered beneficial by the accountants.	The research used the perception of the accountant to detect and to analyze the organizational and operational changes occurred in the accounting function in a selected number of companies that implemented ERP system	Not available	Riccio, E. L. 2000. Analysis of the effects of ERP systems in accounting organization. *Proceedings of 5th International Seminar on Manufacturing Accounting Research*, pp. 1-13, Brazil.
L. M. Hitt, D. J. Wu and X. Zhou	1986 to 1998	H1: Firms that adopt ERP systems will show greater performance as measured by performance ratio analysis, productivity and stock market valuation. H2: There is a drop in performance during ERP implementation as measured by performance ratios and productivity regressions. H3: There is an increase in stock market valuation of a firm at the completion of ERP implementation.	**Sample Size:** The data that are originally used by Brynjolfsson and Hitt (2000) **Statistical tools used:** Descriptive statistics, regression model and Tobin Q model.	Empirical data results have provided general support for hypotheses.	ERP software integrates key business and management processes within and beyond a firm's boundary. It is found that larger firms tend to invest in ERP.	The exact pattern of adoption or the long term impact on productivity may be explored.	Hitt, L. M., D. J. Wu, X. Zhou. 2002. Investment in enterprise resource planning: Business impact and productivity measures. *Journal of Management Information Systems 10*: 71-98.

C. Spathis and S. Constantinides		Research questions: 1. What is the impact of ERP systems on accounting processes? 2. How and to what extent has the application of ERP systems influenced accounting processes? 3. Whycompanies implementing an ERP system have or have not experienced changes in their accounting processes?	**Sample size:** 98 companies **Statistical tools used:** Descriptive statistics as the study is exploratory interview based		Integration of applications, real-time information and particularly information for decision making are the underlying motives for ERP adopters.	Future research may examine the impact of both technical and "Softer" factors in bringing radical changes in accounting processes.	C. Spathis and S. Constantinides. 2004. Enterprise Resource Planning system's impact on accounting processes. *Business Process Management Journal*, Vol. 10, No. 2.
S. Sehgal, S. Subramaniam and F. Deisting	1997 to 2010	H1: There is persistence in current earnings performance. H2: Current earnings performance is less persistent if it is attributable to the accrual component of earnings than to the cash flow component of earnings. H3: Stock price anticipate the average persistence of earnings performance. H4: The earnings expectations rooted in stock prices fail to reveal fully the higher earnings persistence attributable to the cash flow component of earnings and lower earnings persistence	**Sample Size:** 493 companies **Statistical tools used:** T test and correlation	H1, H3 and H4 are supported.	The study examines the persistence of earnings performance , the contribution of accruals and cash flows in the persistence of earnings and whether investors correctly value the information contained in earnings, accruals and cash flows for equity pricing.	The results of the present study are different from those in the developed market which requires further study	S. Sehgal, S. Subramaniam and F. Deisting. 2012. Accruals and cash flows anomalies: evidence from the Indian stock market. *Investment Management and Financial innovations*, Vol. 5, Issue 4.

		attributable to the accrual component of earnings.					
J. E. Hunton, A. Wright and S. Wright		H1: Holding all non-system business interruption and process interdependency risk factors constant, IT audit specialists will assess significantly greater risk differentials between the non-ERP and ERP system than financial auditors. H2: There will be no significant difference in financial auditors' perceived need to consult with IT audit specialists between the ERP and non-ERP settings.	**Sample Size:** 165 auditors **Statistical tools used:** ANOVA and MANCOVA testing model	The first hypothesis is supported but the second hypothesis is accepted	The purpose of this study is to examine the extent to which financial auditors recognize potential differences in business, security and audit risks between non-ERP (Legacy) and ERP computing systems in light of relatively weak security controls.	Auditing firms face the challenge of how to obtain the requisite knowledge to properly evaluate risks in an effective yet efficient manner, which is a significant unresolved issue facing the profession.	Hunton, J. E., A. M. Wright, and S. Wright. 2004. Are financial auditors overconfident in their ability to assess risks associated with enterprise resource planning systems? *Journal of Information Systems 18*: 7-28.
Yoon, S., G. Miller & Jiraporn P. (2006)	1994 to 1997		**Sample size:** 2033 firm-year observations **Statistical Tools used:** Multiple Regressions		The modified Jones model does not fit Korean firms. So this research adopted an extended modified model by including few additional variables i.e. depreciation expenses, bad debt expenses, retirement benefit expenses, and current period expenses.		Yoon, S., G. Miller & Jiraporn P. (2006). Cash from Operations and Earnings Management in Korea, *Journal of International Financial Management and Accounting,* pp. 85-109. doi:10.1111/j.1467-646X.2006.00122.x, http://dx.doi.org/10.1111/j.1467-646X.2006.00122.x

4.2 Summary of ERP research in the context of Bangladesh

The trend of ERP systems implementation is comparatively new in Bangladesh. Hence there exists a very considerably limited number of research papers in the context of Bangladesh. The researcher has found the following papers:

Authors	Study period	Hypothesis tested	Methodology	Major findings	Issue covered	Limitations	References
Md. Morshed Hasan Khan and Md. Abdul Majid	2009		It's a descriptive research. Data were collected from secondary sources including research papers, articles, websites, journals, newspapers etc.	The paper describes the ERP practice, implementation and its impact on the organization in the context of Bangladesh.	Emergence of ERP, Information regarding the tools and techniques of ERP, ERP adoption in Bangladesh, and failure and drawback of ERP system	Future research can be extended to more quantatively and qualitatively examine ERP practice, implementation and problems faced by the adopting firms in Bangladesh perspective.	Khan, M. H. and M. A. Majid. 2009 (published in 2011). Analyzing the perspectives of Enterprise Resource Planning. *D. U. Journal of Marketing*. 133-146.
Md. Maruf Hossan Chowdhury and Mir Mohammed Nurul Absar	2010		Information of three system providers has been collected from the websites. Research questions have been answered by using the relevant literature support from scientific journals and company information found in the website	It is revealed that problem of ERP system creates a number of obstacles in supply chain performance management. However, the ERP system providers are in the way of solving the problems and they claim that they are in a position to solve the problems through emphasizing on customized offer to different segments	a) Supply chain performance management problems due to ERP systems b) Solutions claimed by different ERP vendors	Future research work can be expanded as to how management can resolve the problems caused by ERP in supply chain performance.	Chowdhury, M. H. and M. M. N. Amin. 2010. Enterprise Resource Planning (ERP) problems in supply chain performance. *Proceeding of the International Conference on knowledge globalization.*
A B M Mamun Billah, Dr. Colleen	2008		The paper has been developed using a	There are many factors such as continued top management	Critical success factors for ERP	There remains a greater need for more case study type of research to	Billah, A B M Mamun, C. Puttee, and Y. Ali. 2008. Consideration of

Puttee and Yousuf Ali			combination of ethnographic research and discourse analysis. A passive observation was adopted to examine the implementation process of enterprise resource planning in Bangladesh	support/ involvement throughout the implementation process which is considered critical to the successful implementation in developed and developing countries, whilst there are some factors such as, organizational culture, power distance etc. which should be carefully adjusted at the time of designing the system by the vendors and in the implementation process by the user organization.	implementation in the context of Bangladesh	accentuate the critical factors important to its successful adoption	critical success factors for Enterprise Resource Planning systems implementation in the context of Bangladesh. *The Cost and Management*, July-August.
Islam, Ali & Ahmad (2011)	1985 to 2005	Effectiveness of the modified Jones model is tested with respect to Bangladesh	**Sample Size:** 142 Companies enlisted with DSE **Statistical Tools used:** Multiple regressions	The modified Jones model is not effective in detecting earnings management	The study concludes that an extended modified Jones model is best suited in detecting earnings management in Bangladesh	Not available in the study	Islam et al. (2011), Is Modified Jones Model Effective in Detecting Earnings Management? Evidence from A Developing Economy, *International Journal of Economics and Finance*, Vol. 3, No. 2, 116-125.

Chapter Summary

It is evident from the existing literature that ERP implementation affects the audit and the internal control mechanisms negatively. Moreover, Managers access to accounting information is increased to a greater extent and that's why, managerial discretion is increased. So it is expected that the ERP implementation will result in declined faithful representation of accounting information. This implies that declined faithful representation signals increasing earnings management. On the other hand, its implementation will positively affect relevance of accounting information with respect to predictive and feedback value and also positively affect timeliness of information.

Chapter 5

METHODOLOGY

METHODOLOGY

5.1 Introduction

Since there is dearth of empirical ERP research in Bangladesh, the study has been primarily an exploratory research. The researcher has attempted to explore the effects of ERP implementations on the quality of accounting information. This chapter has discussed the framework of research design, and the specific issues concerning this design.

5.2 The Framework of Research Design

The framework of research design of this study has been delineated below from the context of three elements of inquiry–theoretical perspectives, a brief description of sample companies,and research methods. This also includes variables, sampling, measuring instruments, collection and processing of data and the use of statistical tools in the study.

5.2.1Theoretical Perspective

Institutional theory attempts to describe the deeper and more resilient aspects of how institutions are created, maintained, changed and dissolved (Scott, 2004; Scott, 2008), and deals with the pervasive influence of institutions on human behavior including the processes by which structures as e.g. rules, routines and norms guide social behavior. *Institutions* are multifaceted,durable, resilient social structures, made up of symbolic elements, social activities, and material resources (Currie, 2009; Scott, 2001). Examples of institutions are human rights, societies, enterprise systems, families, handshakes and belief systems like Buddhism. North (1990, 4-5) presents an important, although simplified, distinction between organizations and institutions using a game analogy: Institutions are the rules of the game, and organizations are the players. *Institutionalization* takes *place* when actions are repeated and given shared meanings by actors (Berger and Luckmann, 1966; Scott, 2008), whereby the institution becomes stable and durable (Currie, 2009).

In discussing institutional theory in enterprise system (ES) research it should be emphasized at the outset that it is a general theory spanning economics, political science and sociology (Scott,

2008) rather than a theory specific to enterprise systems or information systems. Institutional theory can be used to address the implementation of ERP systems to "develop a more structural and systemic understanding for how technologies (enterprise systems) are embedded in complex interdependent social, economic, and political networks, and how they are consequently shaped by such broader institutional influences" (Orlikowski and Barley, 2001, 154), and with its ability to deal with the legacies that ES imposes on organizations (Gosain, 2004). It's difficult to apply such theory in practice as this theory in ES research is in its infancy stage (Svejvig, 2013). Existing literature evidences that many ERP research are based on institutional theory (Svejvig, 2013). The researcher has applied the institutional theory for this research, which is an integral part of broader ES.

There are four key features of institutional theory, which seems to be important in order to understand and interpret ES research using institutional theory. The four key features are isomorphism, rationalized myths, bridging macro and micro structures, and institutional logics.

5.2.1.a Institutional and competitive pressures leading to isomorphism

A new approach to institutional analysis was introduced in the 1970s with focus on cultureand cognition, where taken-for-granted rules lead to isomorphism in the formal structures ofthe organization, and organizations had to conform to society for legitimacy (Meyer and Rowan, 1977; Zucker, 1977). DiMaggio and Powell (1983) "moved" the focus on isomorphism from the society level to the organizational field level with coercive, normative and cognitiveinstitutional pressures leading to isomorphism, which is nowadays part of many institutionalanalyses. Isomorphism means "a constraining process that forces one unit in a population toresemble other units that face the same set of environmental conditions" (149) or simplyexpressed as structural similarity. Liang et al. (2007) argue that cognitive, coercive and normativeinstitutional pressures impact the assimilation of enterprise systems, for instance thenormative pressure in an organizational field, where suppliers, customers, consultants, andprofessional associations collectively assess and endorse IS innovations (Swanson and Ramiller,1997), shaping the implementation and assimilation of enterprise systems by providinginstitutional norms that guide top managers (Liang et al., 2007).

Isomorphism is an important consequence of both competitive and institutional pressures (Scott, 2008), and one of the challenges using institutional theory is to distinguish between the two kinds of pressures. Competitive pressures assume a system of rationality, often used in ES research (Dillard and Yuthas, 2006) that emphasizes market competition where organizations compete for resources and customers, and are closely related to the technical environment where product and services are expected to be produced in an effective and efficient way (Scott and Meyer, 1991), but "organizations compete not just for resources and customers, but for political power and institutional legitimacy, for social as well as economic fitness" (Di-Maggio and Powell, 1983, 150). Competitive and institutional pressures "live side by side" and dichotomous explanations shall be avoided, where, e.g., social explanations exclude techno-rational explanations (adapted from Greenwood et al., 2008a, 32), and instead acknowledge that social situations, as ES in organizations, are consisting of interdependent non-rational and rational elements (adapted from Scott, 2008). It is therefore difficult empirically to distinguish between these explanations, being reinforced by the fact that institutional explanations strive to appear technical in nature (Scott and Meyer, 1991) as a disguise. Greenwood et al. (2008a) state that institutional theory is well suited to be juxtaposed with other theories, for instance competitive pressures "explained" by transaction cost theory and institutional pressures explained by institutional theory as presented by Vitharana and Dharwadkar in their paper about IS outsourcing (2007). This facilitates organizational analyses covering both rational and non-rational elements. The next section about rationalized myths elaborates on the "entangleness".

5.2.1.b Rationalized Myths

A key theme related to institutional isomorphism is that organizations conform to rationalizedmyths in order to be a "proper" organization (Boxenbaum and Jonsson 2008). Institutionalizedproducts, services, techniques, regulatory systems, public opinions, professional standards, etc. "act" as powerful myths exerting institutional pressures on organizations in multiple and complex ways. Rationalized myths may develop in organizations, where they *believe* that their responses to these multiple pressures are aimed at organizational efficiency, but they are in reality aimed more at achieving legitimacy for the organization (Meyer and Rowan, 1977). Alvarez (2002) examined the role of myths in an ERP implementation. The old legacy system was deinstitutionalized by creating a story of "performance crisis", and a myth-making

process took place "constructing the new ERP system as an integrated system", which was aligned with the overall organizational goals of the organization, but the benefit of the integration was not supported by objectively testable facts. The rationalized myth thus legitimized the ERP implementation, "and the story-making process served to align the technology with ideal organizational values" (82). The case study by Alvarez does also show the deinstitutionalization process of the old legacy system followed by the re-institutionalization processof the new integrated ERP system (Greenwood et al., 2002; Scott, 2008; Tolbert and Zucker,1999), and that narratives can support the institutionalization process (see also Hedman andBorell, 2004), which can be a relevant "technique" in practical ERP implementations.

5.2.1.c Multiple Levels in Institutional Theory Bridging Macro and Micro Structures

Institutional and competitive pressures are often exerted from the society and the organizational field at the organization, where organizational field is defined as "those organizations that, in the aggregate, constitute a recognized area of institutional life: key suppliers, resource and product consumers, regulatory agencies, and other organizations that produce similar services orproducts" (DiMaggio and Powell, 1983). Scott (2008) argues that it is beneficial to look at multiple levels in a given study in order to enrich the understanding in institutional analysis, and this is exactly one of the powerful features of institutional theory with its ability to operate at varying levels ranging from society, organizational field, organization to individual actor level (Scott, 2008, 85-90). What is likewise important is the reciprocal interaction between levels, where macro structures in society are bridged by organizational fields to micro structures in organizations or even "down" to the individual actor level. Institutional creation and diffusion thus happen, where top-down processes allow higher level structures to shape the structure and action of lower levels, while bottom-up processes shape, reproduce and change the context within, in which they operate (190-195). Scott's (2008) argument is mirrored by Currie (2009), who encourages IS researchers to work with multiple levels and multiple stakeholders as this is the mainstay of institutional theory.

5.2.1.dInstitutional Logics

"Institutional logics shape rational, mindful behavior, and individual and organizational actors have some hand in shaping and changing institutional logics"(Thornton and Ocasio, 2008: 100). Institutional logics link institution and action (Barley and Tolbert, 1997) and provide a bridge between macro structural perspectives (Di-Maggio and Powell, 1983; Meyer and Rowan 1977) and micro process approaches (Zucker,1991). Multiple institutional logics are "available" for organizations and individuals (Scott, 2008), and the embedded agency in institutional logics presupposes partial autonomy for individualsand organizations (Thornton and Ocasio, 2008), so actions, decisions and outcomesare a result of interaction between an individual agency and an institutional structure (Friedlandand Alford, 1991; Thornton and Ocasio, 2008, 103-104).Some IS researchers have addressed institutional logics related to information systems or enterprise systems (Berente et al., 2007; Currie and Guah, 2007; Gosain, 2004). Gosain (2004) argues that mismatch between institutional logics in an enterprise system and the incumbent institutional logics in an organization can lead to institutional misalignment. Varying degrees of mismatch between institutional logics in enterprise systems and organizations can lead to varying degrees of institutional misalignment, which again can have problematic consequences like resistance against the new enterprise system (Gosain, 2004). Other researchers discuss misalignment between enterprise systems and organization, which is similar to Gosain's account, although they do not use the "institutional logic" concept directly (Sia and Soh, 2007; Soh and Sia, 2004).

The concept of institutional misalignments presented by Gosain can be used to emphasize several aspects of institutional logics. First, Fligstein (2001, 100) has criticized institutional theory for considering organizational actors to be passive recipients or "cultural dopes", using readily available scripts provided by government, professionals, or other institutional carriers to structure their actions. However, applying institutional logics counters this critique, where an individual agency plays an important role in selecting and changing institutional logics in the working practices, since "institutional logic is the way a particular social world works" (Thornton and Ocasio, 2008, 101), so users of an enterprise system might adopt the embedded institutional logics in ES, and then change the incumbent organizational institutional logics to fit "the ES logics", so institutional misalignment is reduced, whatever consequences this may have,

but anyway implies an agency from the organizational actors, who are guided by interest, power and opportunism. Second, the changes in institutional logics are part of (or are) the institutional/organizational changes (see also perspectives on institutional change in Hargrave and Van De Ven, 2006) taking place in an organization, for instance by implementing an enterprise system which could be designated a "precipitating technological jolt" starting a change (Greenwood et al., 2002, 60). We can thus analyze the process and stages of change using "institutional logics as a method of analysis" (Thornton and Ocasio, 2008, 109-111). Finally, the institutional logics perspective provides an approach to bridging macro and micro perspectives.

The researcher has applied the first key feature of institutional theory in the study- institutional and competitive pressures leading to isomorphism.

5.3 Hypotheses Development

Brazel and Dang (2005) empirically find that ERP systems adoption increases the management discretion to manage accruals i.e., reliability (Representational faithfulness) and verifiability of accounting information is decreased. Brazel and Dang (2005) empirically proved that reliability in terms of representational faithfulness decreases as managers get the unprecedented opportunity of access to information and throughout the year they can apply their discretion to manage earnings. Moreover, internal control mechanisms and audit function are two means of controlling such discretion. But ERP systems implementations also reduce the effectiveness of these two mechanisms. Financial audit and internal controls are two means in which the managerial opportunities to manipulate the numbers are kept in check and thus provide financial statements to external users that are representationally faithful and reliable. Hogan and Wilkins (2005) find that, even in case of firms with internal control weaknesses, the audit function appears to constrain potential earnings management. Also, internal controls over financial reporting are defined as "a process… to provide reasonable assurance regarding the reliability of financial reporting" (PCAOB, 2004, 147). Following an ERP systems implementation, the ability for firms to manage earnings to meet incentives may increase due to enhanced information access and reductions in the safeguards of audit quality and internal control effectiveness. The expectation that the presence of incentives and increased opportunities results in otherwise managers becoming involved in financial statement management is consistent with

the fraud triangle (AICPA, 2002) and appears to be an accounting application of Wilson and Kelling's (1982) Broken WindowsTheory. The fraud triangle includes: incentives/pressure, opportunity and rationalization/attitude. The Broken Window Theory suggests that the impetus to engage in certain inappropriate behavior does not come from a certain personality type, but rather when environmental features allow such behavior (e.g., broken windows not fixed). Recent research indicates that there may be reductions in internal control effectiveness and audit quality in ERP settings (Wright and Wright, 2002; Hunton et al., 2004; Brazel and Agoglia, 2005). Such combination of increased managerial access to information/discretion over accounting information and weak internal control/poor audit quality will create an avenue for the managers to manipulate the accounting numbers. In light of the above literature review, the following first two hypotheses have been developed (H_0 as null hypothesis; and H_a as alternative hypothesis):

$H_0$1: There is no significant relationship between ERP implementations and the faithful representation of accounting information.
H_a1: ERP implementations decrease the faithful representation of accounting information.

$H_0$2: There is no significant relationship between ERP implementations and the verifiability of accounting information.
H_a2: ERP implementations decrease the verifiability of accounting information.

The third hypothesis naturally flows from the above two. As following an ERP systems implementation, the ability for firms to manage earnings to meet incentives may increase due to enhanced information access and reductions in the safeguards of audit quality and internal control effectiveness, it can be said that ERP implementations decrease the neutrality of accounting information. This led to the development of the third hypothesis:

$H_0$3: There is no significant relationship between ERP implementations and the neutrality of accounting information.
H_a3: ERP implementations decrease the neutrality of accounting information.

Studies relate to the effects of ERP systems implementation such as the effects of ERP systems on earnings management and management of earnings release dates (Brazel and Dang, 2008) which is supported by Chai and Tung, their study examines whether firms releasing earnings reports later than expected engage in earnings management. They also find a positive relationship between ERP implementations and decrease in reporting lag i.e., relevancy of

accounting information is positively affected. Anecdotal evidence suggests that ERP systems adoption can positively affect the timeliness or relevancy of financial accounting information through decreasing the financial close cycle (e.g., Brown, 1997; Jensen and Johnson, 1999; Wah, 2000; Brazel and Dang, 2005). A single study is so far found on all the three components of relevance of accounting information i.e., timeliness, feedback value and predictive value of information (AttayahandSweiti, 2007). AttayahandSweiti (2007) examinee the impact of ERP system on the usefulness of accounting information which covers the timeliness, predictive value and feedback value of the accounting information. They find that ERP use increases the relevance of information with respect to timeliness, predictive value and feedback value. This is supported by Shaakheibari and Oladi (2015). They have conducted the research to evaluate the effect of implementing ERP systems on relevance of accounting data, the subsequent effect of accounting data relevance with a special emphasis on timing and finally on financial reporting quality with a special emphasis on the quality of accruals. These discussions lead to the development of the following hypotheses:

$H_0$4: There is no significant relationship between ERP implementations and the timeliness of accounting information.
H_a4: ERP implementations increase the timeliness of accounting information.

$H_0$5: There is no significant relationship between ERP implementations and the relevance of accounting information.
H_a5: ERP implementations increase the relevance of accounting information.

The following two sub-hypotheses may stem from the fifth hypothesis:

$H_0$5.1: There is no significant relationship between ERP implementations and the feedback value of accounting information.
H_a5.1: ERP implementations increase the feedback value of accounting information.

$H_0$5.2: There is no significant relationship between ERP implementations and the predictive value of accounting information.
H_a5.2: ERP implementations increase the predictive value of accounting information.

5.4 Variables, Sampling, and Collection of Data

The research has been primarily quantitative by nature and later it was supported by a perception study. Fundamental qualitative characteristics namely, faithful representation including

neutrality, relevance including feedback and predictive value and enhancing qualitative characteristics namely verifiability and timeliness have been taken into consideration from the updated IASB Framework (2010) in the present study. Materiality is an entity-specific characteristic. Likewise, understandability is a user-specific characteristic. Besides, it is expected that the ERP results in error-free and complete information. Hence these characteristics of useful information have not been considered in the present study. An extensive literature review relating to ERP implementation and its effect on the quality of accounting information was conducted to identify the variables for the current study. The objectives of the present study were also in view while identifying the variables. Both primary and secondary data were collected. For the secondary part, the following variables are considered:

Table 5.1: Dependent and independent variables for measures of faithful representation and verifiability

For measures of faithful representation and verifiability	Dependent variables	Independent variables
Modified Jones Model:	• Total accruals	• 1/Total assets • (Change in net revenue-Change in net receivable)/Total Assets • Gross PPE/Total Assets
Extended Modified Jones Model:	• Total accruals	• (Change in net revenue-Change in net receivable)/Net Revenue • (Change in cash operating expenses-Change in payables)/Net Revenue • Depreciation/Net Revenue
Neutrality	• Neu1 and Neu2	• Earnings per share • Year-end market price of share

Table 5.2: Dependent and independent variables for measures of relevance

For measures of Relevance	Dependent variables	Independent variables
Predictive value-earnings prediction model	• Future earnings on current earnings i.e., ROA	• Earnings before extraordinary items and discontinued operations • Average total assets
Feedback value	• Feedback value of earnings for year t	• Prediction error of next years earnings without considering current earnings • Prediction error of next years earnings after considering current earnings

5.4.1 The Area of Investigation

The present study was conducted on the non-financial firms enlisted with DSE as on 31 December 2011 that have adopted ERP-based software. The study aims at revealing the usefulness of ERP implementation on accounting information. A structured questionnaire was also administered with the professional accountants in order to support the findings of the present study.

5.4.2 Study Population

ERP is a very new concept in the business context of Bangladesh. The effects of ERP implementation are yet to be explored in Bangladesh. ERP implementation changes the way of doing business. Many companies are in the process of implementing the ERP-based software. From the researcher's survey-based ERP-adopting firms, the population size is 14enlisted firms (non-financial in nature and who have adopted ERP-enabled software up to December 2011).

5.4.3 Sampling

The study is descriptive and the researcher's survey-based list of ERP-adopting firms will be treated as a sampling frame. Since the ready-made sampling frame of the ERP-adopting firms is not available, a survey has been undertaken through telephone-interview using the phone numbers mentioned in the address-database of the listed entities published by the DSE in their monthly publications and available in the DSE's website. During July-December 2011, the researcher contacted all the listed firms (enlisted with DSE up to December 2010) through telephone calls and found 65 firms that are ERP-enabled. Out of 65 ERP-enabled firms, 37 firms have adopted ERP partially. The remaining 28 firms have adopted full version of ERP. Since December 2011, out of these 28 firms, the number of non-financial firms that have adopted full modules of ERP is 14. A summary of ERP-adoption by listed companies has been shown as follows:

Table 5.3: Sector-wise ERP adoption [as on 31 December 2011]

Sector	Total number of listed companies	ERP-adopting companies
Financial	83	28
Non-financial	212	37
Total	**295**	**65**

Source: Personal telephone interviews.

Table 5.4: Industry-wise ERP adoption [as on 31 December 2011]

Industry-category	No. of ERP adopting firms
Banks	3
Insurance	11
Other financial firms	14
Textiles	9
Pharmaceuticals	7
Engineering	6
Food & allied	3
IT	2
Fuel & Power	2
Cement	1
Tannery	1
Ceramic	1
Travel & Leisure	1
Miscellaneous	4
Total	**65**

Source: Personal telephone interviews

Table 5.5: Degree of ERP adoption [as on 31 December 2011]

Degree of ERP adoption	No. of Companies
Full	28
Partial	37
Total	**65**

Source: Personal telephone interviews.

The researcher applied purposive sampling technique in drawing the sample firms. Finally 7 firms were selected as the sample unit. These 7 firms were all non-financial ERP-adopters. The researcher has also taken 7 other non-ERP and non-financial firms as "control" fimswith a view to comparing the effects of ERP implementation on accounting information across ERP-adopting and non-adopting firms. The researcher excluded all the financial ERP-adopting firms because accruals and cash flow patterns of these firms are different from other firms. The names of the selected firms are as follows:

Table 5.6: Selected ERP-adopting and non-adopting companies

ERP-adopting companies	ERP non-adopting companies ("Control" firms)
1. Agni Systems Ltd.	1. ACI Ltd.
2. Bangladesh Lamps Ltd.	2. Apex Foods Ltd.
3. Gemini Sea Food Ltd.	3. Atlas Bangladesh Ltd.
4. GlaxoSmithKline Bangladesh Ltd.	4. Daffodil Computers Ltd.
5. Olympic Industries Ltd.	5. Golden Son Ltd.
6. Prime Textile Ltd.	6. MalekSpining Ltd.
7. Reckit Benckiser Ltd.	7. Square Pharmaceuticals Ltd.

For applying statistical tools, data on selected variables have been taken for a period of 16 years from 1995-96 to 2010-11 in case of financial year or from 1996 to 2011 in case of calendar year. Thus, the sample size for data on selected variables for 7 ERP-adopting firms is 104 firm-years and that for 7 control firms (ERP non-adopting firms) is 77 firm-years. The sample size for individual variable is shown below:

Table 5.7: Sample size for individual variable

Data Category	Variables	Sample sizein firm-years		
		ERP-adopter	**ERP non-adopter**	**Total**
Data for Extended Modified Jones Model	Total accruals/Net Revenue	104	77	**181**
	(Revenue change – Receivable change)/Net Revenue	104	77	**181**
	(Revenue change – Expense change)/Net Revenue	104	77	**181**
	Depreciation/Net Revenue	104	77	**181**
Data for neutrality and timeliness	EPS	94	74	**168**
	Year-end Market price	103	75	**178**
	Reporting Lag	96	75	**171**
Data for relevance items	Average assets	97	70	**167**
	ROA	85	69	**154**
	Earnings before EOI and DO	104	77	**181**

Note: 'EPS' means "earnings per share"; 'ROA' means "return on assets"; 'EOI' means "extraordinary items"; and 'DO' means "discontinued operations".

Sources: Compiled from Annual Reports of the selected companies. See Annexe-6, Annexe-7 and Annexe-8 for details.

As shown above in the table, due to non-availability of data, the sample size for some variables is reduced (which is minimum 85 for ERP-adopting firms, and 69 for control firms).

5.4.4 The Data Collection Period

The data were collected in three phases: first, during the period from July 2011 to December 2011 for preparing the researcher's survey-based list and second, the secondary data were collected from May 2012 to September 2012. Primary data were collected from May to June 2015 by using the questionnaire.

5.4.5 Measuring Instrument and Sources of Data

The study includes both primary and secondary data. The secondary data have been collected from the published annual reports of the selected companies. The primary data have been collected through sending a close-ended structured questionnaire(given in Annexe-2) through e-mail. The questionnaire had four sections. First section was related to demographic profile of the respondents. Other three sections have covered six qualitative characteristics of accounting information through 25 statements for measuring through 5-point Likert scale (12 statements on faithful representation, 1 statement on neutrality, 2 statements on feedback value, 2 statements on predictive value, 4 statements on timeliness and 4 statements on verifiability). The respondents have been selected out of those professional accountants (fellow or associate chartered accountants of the Institute of Chartered Accountants of Bangladesh) who are known to the researcher. Thirty-seven (37)professional accountants were contacted for the purpose and after several reminders through e-mail and cell-phone, out of which, 31 responses were collected; the remaining 6 responses could not be collected due to non-response. Data regarding the nature of the firm, particulars of the firm, ERP adoption etc. are mostly categorical in nature and data regarding the respondents' perceptions collected by using 5-point Likert Scale considering 5 as 'Strongly agree' and 1 as 'Strongly disagree'. The questionnaire was developed based on extensive literature review, keeping in mind the objectives of the study, suggestions from the supervisor and advice from seminar. Moreover an additional format was used to collect the demographic data of the professional accountants to have a broader visualization of the present study. Secondary data source was the annual reports of all the selected companies (7 ERP-adopting companies and 7 control firms) over a period of 16 years (1995/1995-96 to 2011/2010-11).

5.4.6 Models for Testing Faithful Representation and Verifiability

Two models have been applied in this study to test faithful representation and verifiability of accounting information: modified Jones model and extended modified Jones model.

Previous research (e.g. Becker et al. 1998) has used the absolute value of discretionary accruals to measure managers' discretionary use of accounting information. In this study, accounting information faithful representation is measured by the absolute value of discretionary accruals,

with greater values indicating less reliable information and lower values indicating more reliable information. Discretionary accruals are estimated using the cross-sectional modified Jones model (Dechow et al. 1995). Non-discretionary accruals are calculated as the fitted value of the following equation. Discretionary accruals, the measure of accounting information reliability in terms of faithful representation and verifiability, are the absolute value of the residuals of equation.

Studying the related literature, the following model has been developed to test the faithful representation of accounting information:

$$TAC_{i,j,t} = \sim_{1jt}\left(\frac{1}{TA_{i,j,t-1}}\right) + \sim_{2jt}\frac{(\Delta \text{ Re } v_{i,j,t} - \Delta AR_{i,j,t})}{TA_{i,j,t-1}} + \sim_{3jt}\frac{PPE_{i,j,t}}{TA_{i,j,t-1}} + £_{ijt}$$

Where:

$TAC_{i,j,t}$ = total accruals for sample firm *i*in industry *j* at period *t*

$TA_{i,j,t-1}$ =lagged assets, total assets for sample firm *i*in industry *j* at period *t* −1;

$\Delta \text{ Re } v_{i,j,t}$ = change in net revenues for sample firm *i*in industry *j* at period *t* ;

$\Delta AR_{i,j,t}$ = change in net receivables for sample firm *i*in industry *j* at period *t*;

$PPE_{i,j,t}$ = gross property plant and equipment for sample firm *i*in industry *j* at period *t*.

Discretionary accruals are used as a proxy to determine the extent of earnings management. Discretionary accruals are obtained by subtracting non-discretionary accruals from total accruals. Non-discretionary accruals are estimated by using a regression model that regresses total accruals on several explanatory variables. However, a critical drawback to the total accrual approach is that we cannot distinguish discretionary components from non-discretionary components. Therefore a model needs to be developed to separate discretionary accruals from total accruals. Prior research documents that the modified Jones model (Dechow et al., 1995) is effective. However, recently Yoon and Miller (2002b), and Yoon et al., (2006) document that the modified Jones model does not fit for Asian firms (Korean firms). Therefore the new model proposed by Yoon et al., (2006) were employed in this research. The model proposed by Yoon et

al. (2006) has been also applied by Islam et al. (2011) in Bangladesh successfully. The model is described in equation i:

$$TAi/REVi = \beta 0 + \beta 1(\Delta REVi - \Delta RECi)/ REVi + \beta 2 (\Delta EXPi - \Delta PAYi) / REVi + \beta 3(DEPi + RETi) / REVi + \varepsilon i \quad (i)$$

Where,

TA (Total accruals) = accounting earnings – CFO

REV = net sales revenue

REC = receivables

EXP = sum of cost of goods sold and selling and general administrative expenses excluding non-cash expenses.

PAY = payables

DEP = depreciation expenses

Δ = change operator.

The model posits that total accruals will normally depend on changes in cash sales revenue, changes in cash expenses and some non-cash expenses including depreciation expenses. Bad debts and retirement benefit expenses have not been taken into account from the model because of non-availability in the annual reports of the sample firms.

For testing neutrality:

i) $EPS < .50$ $EPS > .50$

ii) $EPS_T - EPS_{T-1}/MKT < .50$ $EPS_T - EPS_{T-1}/MKT > .50$

Where,

EPS = Earnings per share

MKT = Year-end price of share

For testing timeliness:

$$LAG = ¢_0 + ¢_1 AFT + ¢_2 EXTENT + ¢_3 ESURP + ¢_4 IMPYR + ¢_5 AFT * ESURP + ¢_6 EXTENT * ESURP$$

Where,

LAG = Difference between actual earnings announcement and accounting year-end

AFT = Dummy variable, is set to 1 for the years falling after ERP system installation began

IMPYR = Dummy variable, IMPYR is set to 1 for implementation years

Extent = Dummy variable, is set to 1 for the extensive implementers

ESURP = Difference between the EPS in year t and year t-1 scaled by EPS in year t-1.

For testing predictive value:

Earnings prediction model has been used in the study to test predictive value of accounting information, which is as follows:

$$ROA_{t+1} = a_0 + a_1 ROA_t + e_t$$

Where,

ROA = Earnings before extraordinary items and discontinued operations scaled by average total assets

e = error term

For testing feedback value:

$FV_t = [|PE_B| - |PE_A|]$

Where,

FV_t = Feedback value of earnings for year t

PE_B = Prediction error of next years earnings without considering current earnings

PE_A = Prediction error of next years earnings after considering current earnings

The models will be tested with the help of multiple regression analysis.

5.4.7 Stakeholder Interview

With a view to developing an understanding the perception of the stakeholders on the use of ERP in influencing the qualitative characteristics of accounting information, 14 (fourteen) professional accountants (fellow or associate chartered accountants) were interviewed with a list of questions (given in Annexe-1). The responseswere found satisfactory and sound and they were used in justifying some findings. Moreover, on the basis of this, the words in the final questionnaire that seemed ambiguous and confusing were replaced with suitable words for easy understanding of the terms. After making a slight change, the questionnaire was used for final data collection from the respondents (professional accountants).

5.4.8 Reliability Issue

The reliability analysis is an important issue when conducting empirical research. It is an estimate of measurement consistency. It measures the degree in which question items would give consistent or repeatable results. Cronbach's alpha coefficient (Cronbach, 1951) has been calculated for each scale to evaluate the reliability.

The widely accepted social science cut-off is that alpha should be 0.70. But some use 0.75 or 0.80 while others are lenient as 0.60.

The reliability statistics of reliability and relevance of accounting information along with their components for the study is given below:

Table 5.8:Cronbach's Alpha value

Variables	Cronbach's Alpha	No.of items
Faithful representation	.773	12
Verifiability	.972	4
Feedback value	1.000	2
Predictive value	.946	2
Timeliness	.992	4
Relevance	.642	8

From the table, it is seen that the Cronbach's Alpha value of faithful representationare .773 and Alpha value of aggregate relevance is .642, which is considered good for the research.

Technically, Cronbach's Alpha cannot be calculated for neutrality as there is a single statement under this item.

5.4.9 Data Collection

For the purpose of collecting primary data through using questionnaire, after sending the quesnnaire through e-mail, the researcher contacted the respondent professional accountants through e-mail and cell-phone. Where necessary, the researcher gave clarifications about the research topic and made the statements under each variable clear to them so that no ambiguity and/or confusion arose and thus to ensure that the respondents could fill up the questionnaire with confidence from their own perspective.

With respect to secondary data for the models, the researcher himself assimilated the relevant data from the annual reports of the respective companies. The researcher collected most of the annual reports from BSEC and the rest from the respective companies.

5.5 Processing of Data

Data collected for the present study were processed through microcomputer using Statistical Package for Social Sciences (SPSS). The researcher himself tabulated the data. Before feeding the data into computer, all the data were converted into numerical codes and details of this coding were recorded in separate sheets. In addition, data cleaning and consistency checking were also done.

5.6 Statistical Tools Used

Smith (2015) has mentioned different statistical tools in 'Statistical Analysis Handbook'. The following five statistical tools have been used in the study: descriptive Statistics, multiple regression, chi-square test, coefficient of determination and auto regression. Descriptive statistics, coefficient of determination and auto regression are discussed below:

5.6.1 Descriptive Statistics

Descriptive statistics is the term given to the analysis of data that helps describe, show or summarize data in a meaningful way such that, for example, patterns might emerge from the data. Descriptive statistics do not, however, allow the researcher to make conclusions beyond the

data he has analyzed or reach conclusions regarding any hypotheses he might have made. They are simply a way to describe the data.

Descriptive statistics are very important because if the raw data is simply presented, it would be hard to visualize what the data was showing, especially if there was a lot of it. Descriptive statistics therefore enables the researcher to present the data in a more meaningful way, which allows simpler interpretation of the data. Typically, there are two general types of statistic that are used to describe data. Measures of central tendency: these are ways of describing the central position of a frequency distribution for a group of data.A measure of central tendency is a single value that attempts to describe a set of data by identifying the central position within that set of data. As such, measures of central tendency are sometimes called measures of central location. They are also classed as summary statistics. The mean (often called the average) is most likely the measure of central tendency that is the most familiar one, but there are others, such as the median and the mode.Measures of spread: these are ways of summarizing a group of data by describing how spreads out the scores are. Measures of spread help to summarize how spread out these scores is. To describe this spread, a number of statistics are available including the range, quartiles, absolute deviation, variance andstandard deviation.

5.6.2R^2–Coefficient of Determination

All software provides it whenever regression procedure is run. The closer R^2 is to 1, the better is the model and its prediction.A related question is whether the independent variables individually influence the dependent variable significantly. Statistically, it is equivalent to testing the null hypothesis that the relevant regression coefficient is zero.This can be done using t-test. If the t-test of a regression coefficient is significant, it indicates that the variable in question influences dependent variable significantly while controlling for other independent explanatory variables.The researcher used standard multiple regressions in the present study. Multiple regressions examine how multiple independent variables are related to a dependent variable. Where, the R^2 is not smaller in value, the researcher has undertaken alternative research methods by using both qualitative and quantitative instruments.

5.6.3Auto Regression

There exist many models used for time series; however, there are three very broad classes that are used most often. These are the autoregressive (AR) models, the integrated (I) models, and the moving average (MA) models. The most commonly used model for time series data is the autoregressive process. The autoregressive process is a difference equation determined by random variables. The distribution of such random variables is the key component in modeling time series. The time series considered in this paper is the first order autoregressive equation, written as AR(1). The AR(1) equation is a standard linear difference equation

$$Xk = \rho Xk{-}1 + \varepsilon k.\ k = 0, \pm 1, \pm 2, \ldots$$

Where the εk are called the error terms or innovations and are what make up the variability in the time series. For practical reasons, it is desirable to have a unique solution that is independent of time (stationary) and a function of the past error terms. A solution that is independent of time allows one to be able to avoid an initial condition, which may be difficult to find or at an inconvenient location in a time series. A solution as a function of the past error terms is necessary in models used to forecast. It is important to note that the existence of a unique stationary solution is non-trivial. Assumptions about the error terms are made to guarantee a unique stationary solution. Much of the literature on AR models assumes that the error terms are an uncorrelated sequence of random variables with a probability distribution that has zero for the mean and a finite variance. These assumptions limit our ability to model time series that exhibit more volatile behavior such as the stock market or interest rates. Fortunately it has been shown that weaker assumptions can be made to allow the use of distributions that more closely model high volatility time series data without losing the guarantee that there exists a unique stationary solution. This statistical tool suffices to provide a good understanding of manydata sets that are encountered in practice. They do not, however, deal with lagged effects, inwhich what has happened in the past helps to predict the future.

Here is one example of lagged effects, the monthly closings of the Dow Jones Industrial Average. A given month's closing tended to be relatively close to that of the previousmonth.Instead of varying unpredictably about a fixed level, the points

meanderedthrough time, with each month usually closer to the previous month than to the earlier readings in general, and with wide swings of the general level with the passage of time. Such a relationship can be called a lagged effectbecause the result of one time period tends to spill over into the next period or periods. It turned out that the Dow Jones application could be simply analyzed by computing changes or differences from month to month and noting that these appeared to be in a state of statistical control. There are many applications in which the meandering tendency is much weaker than in the Dow Jones application, but in which lagged effects are present and must be contended with. Company sales data often provide a good example. In these applications, however, the lagged effects are less strong, and differencing is usually not a good strategy for analysis. Instead, earlier values of the dependent variable are used –"lagged variables" –asindependent variables in our regression models. The term "autoregression"–"self regression" – is used for such regression models.

5.6.4Independent Sample t-test

The independent-samples t-test (or independent t-test, for short) compares the means between two unrelated groups on the same continuous, dependent variable.A t-test asks whether a difference between two groups' averages is unlikely to have occurred because of random chance in sample selection. A difference is more likely to be meaningful and "real" if (1) the difference between the averages is large, (2) the sample size is large, and (3) responses are consistently close to the average values and not widely spread out (the standard deviation is low).The t-test's statistical significance and the t-test's effect size are the two primary outputs of the t-test. Statistical significance indicates whether the difference between sample averages is likely to represent an actual difference between populations, and the effect size indicates whether that difference is large enough to be practically meaningful.

The "One Sample t-Test" is similar to the "Independent Samples t-Test" except it is used to compare one group's average value to a single number. For practical purposes one can look at the confidence interval around the average value to gain this same information.The "paired t-test" is used when each observation in one group is paired with a related observation in the other group. The "*ranked* independent samples t-test" asks a similar question to the typical *unranked* test but it is more robust to outliers (a few bad outliers can make the results of

an unranked t-test invalid).In case of analyzing the data using an independent t-test, part of the process involves checking to make sure that the data to be analyzed can actually be analyzed using an independent t-test. It is only appropriate to use an independent t-test if the data "passes" six assumptions that are required for an independent t-test to give a valid result. The assumptions are: a) Dependent variable should be measured on a continuous scale (i.e., it is measured at the interval or ratio level),b)Independent variable should consist of twocategorical**,** independent groups, c) There should be independence of observations, which means that there is no relationship between the observations in each group or between the groups themselves, d) There should be no significant outliers. Outliers are simply single data points within your data that do not follow the usual pattern, e) Dependent variable should be approximately normallydistributed for each group of the independent variable**.** The independent t-test requires approximatelynormal data because it is quite "robust" to violations of normality, meaning that this assumption can be a little violated and still provide valid results, f) There needs to be homogeneity of variances. This assumption can be tested in SPSS using Levene's test for homogeneity of variances.

It is a hypothesis testing procedure that uses separate samples for each treatment condition (between subjects design). This test may be used when the population mean and standard deviation are unknown, and 2 separate groups are being compared. It gives us the total amount of error involved in using 2 sample means to estimate 2 population means. It tells us the average distance between the sample difference (x1–x2) and the population difference (μ1–μ2). The standard error is to be estimated using the sample standard deviation or variance and, since there are 2 samples, the two sample variances have to be averaged.

5.7 A Brief Profile of ERP-adopting Firms

The findings for different studies vary due to differences in organizations and industry; therefore, it is imperative to give a brief profile of different organizations under study. The following paragraphs present a brief company profile for each of the selectednon-financial companies that have adopted full version of ERP in the year 1995 or 1995-96:

Agni Systems Limited

Agni systems Limited (the Company) was incorporated on 04 November 1995 as a private company limited by shares registered under the Companies Act 1994. Subsequently the company was converted into a public company limited by shares and is listed both in Dhaka Stock Exchange (DSE) and Chittagong Stock Exchange (CSE) of Bangladesh under the symbol AGNISYSL. The registered office of the company is located at Navana Tower, Gulshan Avenue, Gulshan-1. Dhaka. The main activities of the company are to render service of electronic mail, internet access, electronic data communication, computer networking, electronic data processing, electronic data entry, software development, to provide service of consultancy, to buy, setup, install, produce, rent and deal otherwise in all types of computer, computer peripherals, fax/data modem, computer networking equipment, related accessories, archiving contentment, access network, domestic and international gateways for all type of communication & computer software. Its regulatory authority is Bangladesh Telecommunication Regulatory Commission (BTRC). Number of employees working under this organization is 200. Its business segment is IT sector. Its authorized share capital is tk. 1,000 million and basic EPS is tk, 1.01 (in 2014). It implemented ERP-based software-Dream Saps.

Bangladesh Lamps Limited

Bangladesh Lamps Limited (the Company) is a public limited company that was incorporated in 1960 in Bangladesh under the Companies Act 1913. The authorized capital is 500 million taka divided into 50 million ordinary shares of tk. 10 each. The shares of the company are publicly traded in Dhaka and Chittagong Stock Exchanges (enlisted in 1981). The registered office and the factory of the company is located at Mohakhali, Dhaka. The entire shareholding of Philips Netherland was sold and transferred on 4 March, 1993 to Transcom Limited, a company incorporated in Bangladesh, thus making Bangladesh Lamps Limited a subsidiary of Transcom Limited. At present, its 61.03% shares are held by Transcom Limited and its subsidiary Transcom Electronics Limited. Remaining 38.97% shares are held by institutional and general public including foreign investors. The Company is the eminent producer and seller of Philips and Transtec brand electric bulbs, Transtec brand Compact Fluorescent Lamps (CFL) and Fluorescent Tube Lights (FTL) in local market. It also imports and sells starters and ballasts in the local market. Its business segment is engineering and its basic EPS is tk. 2.12 (in 2014). Its number of employees is 254.

Gemini Sea Food Limited

The Gemini Sea Food Limited is a public company registered under the Companies Act 1913. The Company was incorporated in Bangladesh on 16th September 1982. It has started its operation from 1984. The Company was enlisted with DSE in 1985. Since its inception, Gemini has supplied highest quality seafood products to customers worldwide. Gemini people believe in 'Hygienic Product Healthy Trade' and made it a part of their core values at work, quality, delivery security, social responsibility and respect to Nature are the corner stones of Gemini's business, which has made them the most admired seafood processing companies in Bangladesh. The plant is equipped with cooking and counter cooling system, IQF spiral freezer, vibrating glazer and IQF after freezer/ hardener into the processing line. Its business segment is food & allied. The Company owns and operates a modern shrimps processing plant and exports 100% of its products in the foreign markets. Its registered office is at Dhanmondi, Dhaka and its factory is located at Khulna of Bangladesh. It strongly believes in quality control. Its authorized capital 20 million taka divided into 2.2 million shares of taka 10 per share. Its basic EPS is tk. 1.39 in 2014. Gemini is the pioneer in exporting certified organic shrimps from Bangladesh to EU retailers since 2008. They export their quality products to U.S.A. & EU countries like U.K., Germany, Denmark, Netherlands, Belgium and Russia etc. It implemented ERP based software (SAP 7.2).

GlaxoSmithKline Bangladesh Limited

GlaxoSmithKline Bangladesh Limited (the Company) was incorporated on 25 February 1974 as a public limited company and is listed with Dhaka Stock Exchange Limited in 1976. The Company is a subsidiary of GlaxoSmithKline Plc, UK through its fully owned subsidiary Setfirst Limited, UK. The principal activities of the Company throughout the year continued to be manufacturing and marketing of pharmaceuticals, vaccines and consumer healthcare products. Its business segment is pharmaceuticals. Its average number of employees is 714. Its basic EPS is tk. 68.63. Its registered office is located at Gulshan 1, Dhaka and its factory is at Chittagong, Bangladesh. GlaxoSmithKline (GSK) Bangladesh Limited carries with it an enviable image and reputation for the past 6 decades. A subsidiary of GlaxoSmithKline plc- one of the world's leading research-based pharmaceutical and healthcare companies GSK Bangladesh, continues to be committed to improving the quality of human life by enabling people to do more, feel better and live longer. The Company's principle activities include secondary manufacture of

pharmaceutical products and marketing of vaccines, pharmaceutical healthcare products and health food drinks. It implemented ERP-enabled software (ZeadwardZetex).

Olympic Industries Limited

The Olympic Industries Limited (Formerly Bengal Carbide Limited) (the company) is a company incorporated and domiciled in Bangladesh as a public limited company. It commenced commercial operation in 1982 and went for public issue of shares in 1984. The shares of the company are listed in the Dhaka and Chittagong Stock Exchanges of Bangladesh in 1989. The registered office of the company is located at Motijheel Commercial Area, Dhaka. The industrial units are located at Kanchpur and Bondar of Narayangong. The principal activities of the company throughout the year continued to be manufacturing and marketing of Dry Cell Battery, Biscuit & Candy, Confectionery and Ball pen items. The products are sold in the local market. During the year 2009, based on a decision adopted by the shareholders of the company and due permission from the Hon'ble High Court, the erstwhile Tripti Industries Ltd amalgamated with the company. It has authorized capital of taka 1,000 million divided into 100 million of tk. 10 per share. Its business segment is engineering and its basic EPS is tk. 7.39. It has implemented its ERP-based software (SAP).

Prime Textile Mills Limited

Prime Textiles Spinning Mills Limited is a public company limited by shares incorporated under the Companies Act 1913 in 1989. The company manufactures and markets Export Quality Knit/Woven Cotton & mixed yarn. The company has a total production capacity of 10,274,528 kg. at 30 count equivalent in three shifts against which during the year, capacity utilization was 37.02% as against 56.11% of previous year. Shortfall in utilization of production capacity was due to power shortage, change of production range from cotton yarn to mélange yarn and non-availability of sufficient orders. The company owns and operates a textile spinning mill comprising 3 units, viz, of unit-1, unit-2 and unit-3 and its principal activities and operation are manufacturing and marketing of Export quality knit/woven and mixed yarn. The place of business is the registered office at Kadamtali, Shyampur, Dhaka and all the factory units are located at Narayangang. The number of employees is 2150. Its business segment is textile and its

basic EPS is tk. 1.17 in 2014.It has implemented ERP- based software (SAP). It authorized share capital of tk. 1,500 million divided into 150 million shares of tk. 10 per share.

Reckitt Benkiser (BD) Limited

Reckitt Benckiser Group plc (RB) (LSE: RB) is a multinational consumer goods company headquartered in Slough, Berkshire, England. It is a producer of health, hygiene and home products.[4] It was formed in 1999 by the merger of the UK-based Reckitt & Colman plc and the Netherlands-based Benckiser NV. Reckitt Benckiser (Bangladesh) Limited (DSE: RECKITTBEN) was incorporated in 1961, in the then East Pakistan, as 'Robinson Foods (Pakistan) Limited'. Later on, it underwent several changes in its identity, finally to settle in as Reckitt Benckiser (Bangladesh) limited, following a merger with Benckiser in 2000. The company was listed in DSE in 1986 and in CSE in 1995. Currently, RECKITTBEN is a leading player in the FMCG market of Bangladesh with a focus on Health, Hygiene & Home. Key Revenue Drivers & Company Insight RECKITTBEN is involved in the business of manufacturing and marketing Household, Toiletries and Pharmaceuticals items. The company's product array includes brands like Disprin, Dettol, Harpic, Mortein, Moov, Veet etc. 96% of the company's revenue come from household & toiletries products. The Pest control product, Mortein contributes a major portion of revenue of the company. However, fierce competition in the segment is forcing the profit margin down and affecting the overall performance of the company. Its business segment is pharmaceuticals and its basic EPS in 2013 is 27.42 tk. It has implemented ERP-enabled software (IBM).

5.8 Limitations of the Study

The researcher has taken number of precautions to increase the reliability of the present study, yet it is felt that there are certain limitations which may be given due considerations in interpreting the results. Therefore, the results have to be interpreted in the light of these limitations. These may be enumerated as follows:

a) As Bangladesh is in an infancy stage with respect to ERP implementation, the number of selected companies was small.

b) The population of the study was limited to non-financial public limited companies only. Therefore, sampling has been carried out from non-financial public limited companies only. Private limited companieswere totally ignored in the study.

c) In case of primary data, there was a possibility of respondent's bias also. The respondents may have given the answers which may be desirable from their point of view.

d) For the collection of primary data, only the opinion of the professional chartered accountants has been taken into account. The views of the management, the stockholders and the regulators, if considered, the research findings might be more strengthened.

e) Data unavailability is one of the main constraints of the study including the absence of the annual reports of different years in the market. Few data including retirement benefit expense were not included in the annual report.

f) Purposive or convenience sampling has been used in selecting companies and choosing respondents for demonstrating questionnaire, which lacked in applying the randomness. Thus, the generalization of findings is limited by this constraint.

Chapter 6

RESULTS, ANALYSES AND FINDINGS OF THE STUDY

RESULTS, ANALYSES AND FINDINGS OF THE STUDY

This chapter deals with the results and analyses of data relating to effects of ERP implementation on accounting information in the listed non-financial companies (enlisted with DSE) using different statistical tools such as multiple regression, auto regression, chi-square test, descriptive statistics and finally,enumerates the major findings of the study.

6.1 Faithful Representation and Verifiability of Accounting Information

6.1.1 Modified Jones Model

In this study, accounting information faithful representation and verifiability are measured by the absolute value of discretionary accruals, with greater value indicating less faithful information. Similar to the accrual measure in Bharath et al. (2004) and Hribar and Collins (2002), total accruals (TAC) are calculated as the difference between income before extraordinary items and operating cash flows net of cash flows from extraordinary items scaled by average total assets. This is based on cash flow statement approach. Discretionary accruals are estimated using the cross-sectional modified Jones model (Dechow et al., 1995). The author conducted the following regression model for 7 ERP user and 7 non-user firms for 16 years starting from 1995-96 to 2010-2011 irrespective of any industry classification in order to test faithful representation and verifiability:

$$TAC_{i,t} - \alpha_{1t}\left(\frac{1}{TA_{i,t-1}}\right) + \alpha_{2t}\frac{(\triangle \mathrm{Re}v_{i,t} - \triangle AR_{i,t})}{TA_{i,t-1}} + \alpha_{3y}\frac{PPE_{i,t}}{TA_{i,t-1}} + \varepsilon_{it}$$

Where,

$TAC_{i,t}$ = Total accruals for sample firm i at period t;

$TA_{i,t-1}$ = Lagged assets, total assets for sample firm i at period t;

$\triangle \mathrm{Re}v_{i,t}$ = Change in revenues for sample firm i at period t;

$\triangle AR_{i,t}$ = Change in receivables for sample firm i at period t;

$PPE_{i,t}$ = Gross property plant and equipment for sample firm i at period t;

As the value of significance is more than 0.05 in the ANOVA table, the null hypotheses are not rejected i.e., there is no statistically significant relationship between the aforementioned dependent and independent variables for ERP user firms [tables 6.3 & 6.7]. This is obvious that ERP usage does not decrease faithful representation and verifiability. With respect to ERP non-adopting firms, as the value of significance is less than 0.05 in the ANOVA table, the null hypothesis is rejected i.e., there is a statistically significant relationship between the variables.

Regression Results

Table 6.1: Variables Entered/Removed (b, c) – ERP usage

Model	Variables Entered	Variables Removed	Method
1	IV_3, IV_2, IV_1(a)	.	Enter

a All requested variables entered.

b Dependent Variable: Total Accruals

c ERP usage = ERP usage

Table 6.2 Model Summary (b)- ERP usage

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.057(a)	.003	-.028	.10836

a Predictors: (Constant), IV_3, IV_2, IV_1
b ERP usage = ERP usage

Table 6.3: ANOVA (b, c) –ERP usage

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.004	3	.001	.104	.957(a)
	Residual	1.139	97	.012		
	Total	1.143	100			

a Predictors: (Constant), IV_3, IV_2, IV_1
b Dependent Variable: Total Accruals
c ERP usage = ERP usage

Table 6.4: Coefficients (a, b) –ERP usage

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.033	.021		-1.566	.121
	IV_1	-388870.898	3601359.839	-.011	-.108	.914
	IV_2	-.011	.020	-.054	-.532	.596
	IV_3	.003	.029	.013	.122	.903

a Dependent Variable: Total Accruals
b ERP usage = ERP usage

ERP usage = ERP non-use

Table 6.5: Variables Entered/Removed (b, c)- ERP non-usage

Model	Variables Entered	Variables Removed	Method
1	IV_3, IV_1, IV_2(a)	.	Enter

a All requested variables entered.
b Dependent Variable: Total Accruals
c ERP usage = ERP non-use

Table 6.6: Model Summary (b) –ERP non-usage

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.416(a)	.173	.138	.13517

a Predictors: (Constant), IV_3, IV_1, IV_2
b ERP usage = ERP non-use

Table 6.7: ANOVA (b, c)–ERP non-usage

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.271	3	.090	4.950	.004(a)
	Residual	1.297	71	.018		
	Total	1.569	74			

a Predictors: (Constant), IV_3, IV_1, IV_2
b Dependent Variable: Total Accruals
c ERP usage = ERP non-use

Table 6.8: Coefficients (a, b) –ERP non-usage

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.035	.026		-1.342	.184
	IV_1	-5904563.919	14421054.872	-.045	-.409	.683
	IV_2	.074	.036	.223	2.019	.047
	IV_3	.086	.031	.316	2.816	.006

a Dependent Variable: Total Accruals
b ERP usage = ERP non-use

As null hypothesis is rejected, faithful representation and verifiability of accounting information is declined on ERP implementations according to modified Jones model, which substantiated first and second hypotheses (H_a1 and H_a2).

6.1.2 Extended Modified Jones Model

Discretionary accruals are used as a proxy to determine the extent of earnings management. Discretionary accruals are obtained by subtracting non-discretionary accruals from total accruals. Non-discretionary accruals are estimated by using a regression model that regresses total accruals on several explanatory variables. However, a critical drawback to the total accrual approach is that we cannot distinguish discretionary components from non-discretionary components. Therefore a model needs to be developed to separate discretionary accruals from total accruals. Prior research documented that the modified Jones model (Dechow et al., 1995) is effective. However, Yoon and Miller (2002b), and Yoon et al., (2006) documented that the modified Jones model does not fit for Asian firms (Korean firms). Therefore the new model proposed by Yoon et al., (2006) was employed in this research. The model proposed by Yoon et al. (2006) has been also applied by Islam et al. (2011) in Bangladesh successfully. The model is described in equation i:

$$TAi/REVi=\beta0+ \beta1(\Delta REVi– \Delta RECi)/ REVi + \beta2 (\Delta EXPi – \Delta PAYi) / REVi + \beta3(DEPi + RETi) / REVi + \varepsilon i \qquad (i)$$

Where
TA (Total accruals) = accounting earnings – CFO
REV = net sales revenue
REC = receivables
EXP = sum of cost of goods sold and selling and general administrative expenses excluding non-cash expenses.
PAY = payables
DEP = depreciation expenses
Δ = change operator.

The model posits that total accruals will normally depend on changes in cash sales revenue, changes in cash expenses and some non-cash expenses including depreciation expenses.

Regression Results

ERP Usage Status = ERP Usage

Table 6.9: Variables Entered/Removed[a,b]-ERP usage

Model	Variables Entered	Variables Removed	Method
1	IV3, IV1, IV2[c]	.	Enter

a. ERP Usage Status = ERP Usage
b. Dependent Variable: TA/rev
c. All requested variables entered.

Table 6.10: Model Summary[a]-ERP usage

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.409[b]	.168	.143	.00000

a. ERP Usage Status = ERP Usage
b. Predictors: (Constant), IV3, IV1, IV2

Table 6.11: ANOVA[a,b] –ERP usage

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.000	3	.000	6.849	.000[c]
	Residual	.000	102	.000		
	Total	.000	105			

a. ERP Usage Status = ERP Usage
b. Dependent Variable: TA/rev
c. Predictors: (Constant), IV3, IV1, IV2

Table 6.12: Coefficients[a,b]-ERP usage

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-3.049E-12	.000		-.107	.915
	IV1	1.387E-10	.000	.179	1.888	.062
	IV2	-4.168E-11	.000	-.107	-1.129	.261
	IV3	-2.765E-9	.000	-.381	-4.195	.000

a. ERP Usage Status = ERP Usage

b. Dependent Variable: TA/rev

ERP Usage Status = ERP non-usage

Table 6.13: Variables Entered/Removed[a,b]-ERP non-usage

Model	Variables Entered	Variables Removed	Method
1	IV3, IV1, IV2[c]	.	Enter

a. ERP Usage Status = ERP Non-usage

b. Dependent Variable: TA/rev

c. All requested variables entered.

Table 6.14: Model Summary[a]-ERP non-usage

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.332[b]	.110	.073	.00000

a. ERP Usage Status = ERP Non-usage

b. Predictors: (Constant), IV3, IV1, IV2

Table 6.15: ANOVA[a,b]-ERP non-usage

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.000	3	.000	2.936	.039[c]
	Residual	.000	71	.000		
	Total	.000	74			

a. ERP Usage Status = ERP Non-usage

b. Dependent Variable: TA/rev

c. Predictors: (Constant), IV3, IV1, IV2

Table 6.16: Coefficients[a,b]-ERP non-usage

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.728E-11	.000		1.069	.289
	IV1	-2.599E-12	.000	-.036	-.178	.859
	IV2	4.798E-12	.000	.620	2.360	.021
	IV3	-5.113E-9	.000	-.670	-2.891	.005

a. ERP Usage Status = ERP Non-usage

b. Dependent Variable: TA/rev

As the value of significance is less than 0.05 in the ANOVA table, the null hypothesis is rejected i.e., there is a statistically significant relationship between the aforementioned dependent and independent variables for ERP user firms and ERP non-user firms. [Tables 6.8and table 6.12]. This is clear that ERP usage decreases faithful representation and verifiability according to extended modified Jones model, which also substantiated H_a1 and H_a2.

6.2 Neutrality of Accounting Information

The researcher used two inverse measures of neutrality based on current and prior period reported earnings per share (EPS). These two measures are indicator variables (Neu1 and Neu2) for firms meeting or slightly beating earning thresholds: avoiding negative earnings and avoiding earnings decrease[1]. Neu1 (Neu2) is an indicator variable for firm-year observations that fall in the first bin to the right of zero in the distribution of EPS (change in EPS) scaled by fiscal year-end market price. The researcher defines the distribution bin width at 0.50%. Firms less than the earnings value .50 is expected to manage the earnings (lack of neutrality) and firms equal or greater than the value 0.50 is expected not to manage earnings (neutral)[2]. The following models are used:

[1] The researcher did not use the other earnings management threshold (i.e., analysts' forecasts) because analysts' forecast is not available in Bangladesh. Hence all his measures are based on only financial statement data. Also, an inclusion of a measure based on analyst data drastically reduces his sample size.

[2]The choice of bin width at 0.50% is ad hoc. Prior studies use different bin width. For example, (e.g. Altamura et al. (2005) use 0.75%, and Brown and Caylor (2005) report results using 0.25%, Barua (2005) uses 0.50%. According to the study of Barua, results remain largely similar irrespective of whatever bin width is used.

EPS/MKT<.50 EPS/MKT>=.50

EPSt-EPS t-1/MKT <.50 EPSt-EPS t-1/MKT >=.50

Since the value of significance is more than .05 in the chi-square test (.575 and .206 respectively), the null hypothesis is not rejected i.e., there is no statistically significant relationship between the variables for ERP user firms and ERP non-user firms. It is clear from the table 6.17 and 6.19 that ERP usage does not decrease the neutrality of accounting information. Thus H_a3 is not supported in this study.

Table 6.17: Chi-Square Tests for ERP usage

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.744(b)	1	.388		
Continuity Correction(a)	.000	1	1.000		
Likelihood Ratio	1.112	1	.292		
Fisher's Exact Test				1.000	.575
Linear-by-Linear Association	.740	1	.390		
N of Valid Cases	181				

a Computed only for a 2x2 table
b 2 cells (50.0%) have expected count less than 5. The minimum expected count is .43.

Table 6.18: Symmetric Measures for ERP use

		Value	Approx. Sig.
Nominal by Nominal	Phi	.064	.388
	Cramer's V	.064	.388
N of Valid Cases		181	

a Not assuming the null hypothesis.
b Using the asymptotic standard error assuming the null hypothesis.

Crosstabs

Table 6.19: Chi-Square Tests for ERP non-use

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	1.303(b)	1	.254		
Continuity Correction(a)	.683	1	.408		
Likelihood Ratio	1.364	1	.243		
Fisher's Exact Test				.350	.206
Linear-by-Linear Association	1.295	1	.255		
N of Valid Cases	160				

a Computed only for a 2x2 table
b 1 cells (25.0%) have expected count less than 5. The minimum expected count is 4.81.

Table 6.20: Symmetric Measures for ERP non-use

		Value	Approx. Sig.
Nominal by Nominal	Phi	-.090	.254
	Cramer's V	.090	.254
N of Valid Cases		160	

a Not assuming the null hypothesis.
b Using the asymptotic standard error assuming the null hypothesis.

6.3 Relevance of AccountingInformation – Predictive Value

Predictive value is measured in terms of the ability of earnings to predict future earnings. To measure predictive ability of earnings, the researcher used a model where future earnings are regressed on current earnings. The model used in the study is as follows:

$ROA_{t+1} = \lambda_0 + \lambda_1 ROA_t + e_t$(4)

Following Francis et al. (2004) and Barua (2005), the researcher estimated an autoregressive model in the aforementioned model using maximum likelihood estimation.

H_0: There is no linear relationship
H_a: There is a linear relationship
F= 120.698
Sig. = .000

As the value of significance is less than 0.05, null hypothesis is rejected i.e., there is a statistically significant linear relationship between ROA_{t+1} and$ROA_{t.}$

H:$_0$ $\beta = 0$
H_a: $\beta \neq 0$
t = 10.986
sig. = 0.000

As the value of significance is less than 0.05, null hypothesis is rejected i.e., the value of coefficient is statistically significant.

Here, the strength of association is measured by coefficient of determination, R^2 = .476. So the variation in the dependent variable can be explained by the variation in the independent variable by 47.60%. [table 6.22]

RegressionResults

Table 6.21: Variables Entered/Removed (b) for predictive value

Model	Variables Entered	Variables Removed	Method
1	ROA(a)	.	Enter

a All requested variables entered.
b Dependent Variable: ROAt1

Table 6.22: Model Summary for predictive value

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.690(a)	.476	.472	.06185

a Predictors: (Constant), ROA

Table 6.23: ANOVA(b) for predictive value

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.462	1	.462	120.698	.000(a)
	Residual	.509	133	.004		
	Total	.971	134			

a Predictors: (Constant), ROA
b Dependent Variable: ROAt1

Table 6.24: Coefficients(a) for predictive value

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.039	.006		6.052	.000
	ROA	.454	.041	.690	10.986	.000

a Dependent Variable: ROAt1

As the null hypothesis is rejected, test results supported $H_a5.2$ i.e., ERP implementations increase the predictive value of accounting information.

6.4 Relevance of Accounting Information–Feedback Value

The author estimated the feedback value of earnings by measuring the ability of current year's earnings to change the prediction about next year's earnings. The feedback value is measured by the difference between absolute prediction errors for next year before and after considering current year's earnings.

$$FV_t = [| PE_B| - | PE_A|]$$

Where, FV_t = Feedback value of earnings for year t.

PE_B = Prediction error of next year's earnings without considering current earnings

PE_A = Prediction error of next year's earnings after considering current earnings

If $|PE_B| > |PE_A|$, then feedback value is positive. However, to be consistent with other inverse measures, the researcher uses negative value of FV_tas the inverse measure of feedback value. He uses a measure of feedback value based on the following prediction model:

$$ROA_{t+1} = \lambda_0 + \lambda_1 ROA_t + e_t \quad (4)$$

Where, ROA = Earnings before extraordinary items and discontinued operations scaled by average total assets.

e = error term

Here, the researcher provided a description of the method that he used to estimate feedback value through an example. Suppose he estimated the feedback value of earnings for 1997 of a particular firm.

Step 1: Estimate prediction error of 1998 based on actual earnings of 1997:

The author derives $\lambda_0$and $\lambda_1$from equation (4) by estimating regression with observations over a period starting from 1995-96 through 2010-11.

$$PROA_{1998} = \lambda_0 + \lambda_1 ROA_{1997}$$

$$PErrorA_{1998} = ROA_{1998} - PROA_{1998}$$

Where,

$PROA_{1998}$ = Predicted ROA for 1998 by using time-series data till 1997.

$PErrorA_{1998}$= Prediction error for 1998 using time-series data till 1997.

Step 2: Estimate prediction error of 1998 based on actual earnings of 1996:

The researcher derives λ_0 and λ1from equation (4) by estimating regression with observations over a period starting from 1995-96 through 2009-2010.

$$PROA_{1997} = \lambda_0 + \lambda_1 ROA_{1996}$$

$$PROA\_B_{1998} = \lambda_0 + \lambda_1 PROA_{1997}$$

$$PErrorB_{1998} = ROA_{1998} - PROA\_B_{1998}$$

Where,

$PROA_{1997}$ =Predicted ROA for 1997 by using time-series data till 1996.

$PROA\_B_{1998}$ = Predicted ROA for 1998 based on predicted ROA of 1997.

$PErrorB_{1998}$ = Prediction error for 1998 using time-series data till 1996.

Step 3: Feedback value (FV) of earnings for 1997:

FV_pve_{1997}=| $PErrorB_{1998}$| - | $PErrorA_{1998}$|

H_0: There is no linear relationship

H_a: There is a linear relationship

F= 5.148

Sig. = .025

As the value of significance is less than 0.05, null hypothesis is rejected i.e., there is a statistically significant linear relationship between the variables.

H_0: $\beta = 0$

H_a: $\beta \neq 0$

t = 2.269

sig. = .025

As the value of significance is less than 0.05, null hypothesis is rejected i.e., the value of coefficient is statistically significant.

Here, the strength of association is measured by coefficient of determination, R^2 = .033 (R=.182). So the variation in the dependent variable can be explained by the variation in the independent variable by 3.3% [table 6.26].

Regression Results

Table 6.25: Variables Entered/Removed(b) for feedback value

Model	Variables Entered	Variables Removed	Method
1	year(a)	.	Enter

a All requested variables entered.

b Dependent Variable: ROA

Table 6.26: Model Summary(b) for feedback value

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.182(a)	.033	.027	.12154

a Predictors: (Constant), year
b Dependent Variable: ROA

Table 6.27: ANOVA(b) for feedback value

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.076	1	.076	5.148	.025(a)
	Residual	2.231	151	.015		
	Total	2.307	152			

a Predictors: (Constant), year
b Dependent Variable: ROA

Table 6.28: Coefficients(a) for feedback value

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-10.257	4.559		-2.250	.026
	year	.005	.002	.182	2.269	.025

a Dependent Variable: ROA

Table 6.29: Case wiseDiagnostics(a) for feedback value

Case Number	Std. Residual	ROA
125	8.923	1.20

a Dependent Variable: ROA

Table 6.30: Residuals Statistics(a) for feedback value

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	.0479	.1201	.0862	.02237	153
Residual	-.17188	1.08454	.00000	.12114	153
Std. Predicted Value	-1.716	1.514	.000	1.000	153
Std. Residual	-1.414	8.923	.000	.997	153

a Dependent Variable: ROA

Since the null hypothesis is rejected, the research hypothesis holds good (H_a5.1) i.e. ERP implementations increase the feedback value of accounting information.

6.5 Timeliness of Accounting Information

The other chief benefit of ERP system implementations cited by Poston and Grabski (2001) is improved efficiencies through computerization. From the context of financial accounting information, this indicates a reduction in the financial reporting cycle for ERP system adopters. Indeed, anecdotal evidence and surveys of ERP adopters suggest that ERP systems reduce reporting lags by processing business transactions more efficiently and reducing the financial close cycle (e.g., Mabert et al. 2000; Wah 2000; Hitt et al. 2002; Olhager and Selldin 2003).A reduction in the length of the reporting cycle should allow adopters to provide financial statements to the external users in a more timely manner and consequently increase the relevance of accounting information. Reporting lag is taken as the difference between the closure of accounting period and date of sending the annual general meeting (AGM) notice to the stakeholders.

The mean values of reporting lag (measured in number of days) of ERP user firms and ERP non-user firms are 158 days and 163 days approximately. Here it can be observed that firms using ERP have less reporting lag than firms not using ERP but the difference between the means is not statistically significant (t = .519, sig. = .605 with df = 170) [table 6.31 and 6.32]. Here, the null hypothesis is not rejected and the research hypothesis (H_a4) is not substantiated.

T-Test

Table 6.31: Group Statistics

	ERP Usage	N	Mean	Std. Deviation	Std. Error Mean
Difference	Use	96	158.00	83.104	8.482
	Non-use	76	162.93	37.549	4.307

Table 6.32: Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Difference	Equal variances assumed	16.489	.000	-.480	170	.632	-4.934	10.279	-25.224	15.356
	Equal variances not assumed			-.519	138.635	.605	-4.934	9.513	-23.743	13.875

6.6 Field Survey–Respondents' Profile

In this section a brief profile of the respondents is presented. It is imperative to have an idea regarding the demographic status of the respondents. Demographic data have been collected for gender, age, professional intimation, academic qualification, professional experience and ERP experience.

Table 6.22 shows the frequency distribution of the respondents based on gender.

Table 6.33: Gender

	Frequency	Percentage
Male	30	96.8
Female	1	3.2
Total	**31**	**100.0**

Source: Field Survey, 2015

Table 6.22 shows that only 1 respondent is female out of 31 respondents which is 3.2 percent of the total respondents.

Table 6.23 shows that 71 percent of the respondents fall in the group of 30 years to 40 years and 22.6 percent of the respondents fall in the group of 40 years to 50 years and only 6.5 percent of the respondents fall in the group of more than 50 years. It is noticeable that the majority of the professional accountants (71 percent) are young in the profession.

Table 6.34: Age

	Frequency	Percentage
30-40 years	22	71
40-50 years	7	22.6
50 years or more	2	6.5
Total	**31**	**100**

Source: Field Survey, 2015

The majority of the respondents are Fellow Chartered Accountants (FCA) which is 64.5 percent of the total respondents which is clear from the following table:

Table 6.35: Professional Intimation

Professional Intimation	Frequency	Percentage
FCA	20	64.5
ACA	11	35.5
Total	**31**	**100.0**

Source: Field Survey, 2015

Whether they are ACAs or FCAs, all of them have got the practicing certificate from ICAB for audit.

Table 6.36: Academic Qualification

Academic Qualification	Frequency	Percentage
Graduation	14	45.2
Post Graduation	17	54.8
Total	**31**	**100.0**

Source: Field Survey, 2015

Most of the Chartered accountants (54.8 percent) have possessed the highest academic qualification i.e., masters or MBA degree.

Table 6.37: Professional Experience

Experience	Frequency	Percentage
0-5 years	9	29.0
5-10 years	13	41.9
10-15 years	6	19.4
More than 15 years	3	9.7
Total	**31**	**100.0**

Source: Field Survey, 2015

Out of 31 professional accountants, 13 have the moderate experience of 5 to 10 years. Only 9.7% of the total respondents have got the highest professional experience. It is noticeable that 9 auditors have the lowest professional experience of 0 to 5 years, of which only 1 auditor is a fresher i.e., 0 year of experience.

Table 6.38: ERP Experience

Yes/No	Frequency	Percentage
Yes	18	58.1
No	13	41.9
Total	**31**	**100.0**

Source: Field Survey, 2015

Table 6.27 shows that 58.1 percent of the total respondents do have ERP experience i.e., conduct audit in at least a single ERP-enabled firm.

6.7 Descriptive Statistics

Descriptive statistics including maxima, minima, mean value and standard deviation of all the 25 statements have been organized from the response of 31 professional accountants. The same statistics have also been calculated for faithful representation (f-rep), neutrality (neu) and verifiability (ver). The value of faithful representation is 2.7823 and the standard deviation is .46182. Mean value and standard deviation of feedback value (rel_fv), predictive value (rel_pv) and timeliness (time) have been calculated. The aggregate mean value of relevance is 4.4274 and standard deviation is .37065.

Table 6.39: Descriptive Statistics

	Mean	Std. Deviation
ERP adoption increases managerial access to information	3.3226	1.10716
ERP adoption increases the extent of managerial discretion	3.3226	1.10716
ERP adoption facilitates the CEO and the CFO to certify that their company's financial statements and accompanying disclosures fairly represent the results of operation	3.6774	1.01282
ERP adoption facilitates the preparation of internal control report by management, management assertion as to the effectiveness of the firm's internal control structure in the report	3.7097	.97275
ERP adoption facilitates the disclosure of firm's compliance with Companies Act 1994, IFRS, SEC guidelines and other relevant applicable laws	3.7419	.92979
ERP decreases adequate separation of duties	2.6129	.91933
ERP decreases proper authorization of transactions and activities	2.3871	.80322
ERP decreases adequate documents and records	2.2581	.77321
ERP decreases physical control over assets and records	2.1935	.70329
ERP decreases independent checks on performance	2.1935	.70329
ERP decreases the effectiveness of audit mechanisms	2.1290	.67042
ERP decreases the effectiveness of internal control mechanisms	1.8387	.37388
ERP increases the possibility that reported facts may influence the investor\s opinion or behavior	1.8710	.34078
ERP adoption decreases the extent of consensus of accounting measures among different observers	2.0645	.67997
ERP adoption decreases the assurance of correspondence of accounting information to economic events	2.0645	.67997
ERP adoption decreases the number of direct verification in different items	2.1613	.73470
ERP adoption increases the number of indirect verification to different items	2.1613	.73470
ERP provides information that is adequate in assessing whether reported results confirm previous expectations of users	4.3226	.74776
ERP provides feedback to users as to how various market events and significant transactions affected the company	4.3226	.74776
ERP provides information that is useful in assessing the likely levels of recurring earnings., the company's sustainable earnings potential	4.3871	.55842
ERP permits users to identify and assess the differing opportunities and risks contained within the company's various businesses	4.3226	.54081

ERP increases timeliness for complying with SEC filing requirements/ publication of annual and interim reports	4.6129	.49514
ERP adoption enables the company management to publish its financial statements earlier as compared with its competitor	4.6129	.49514
ERP enables the management to find new ways of communicating financial information	4.6129	.49514
ERP adoption increases timeliness of reporting	4.5806	.50161
f_ rep	2.7823	.46182
neu	1.8710	.34078
ver	2.1129	.67958
rel_fv	4.3226	.74776
rel_pv	4.3548	.53531
time	4.6048	.49064
arelevance	4.4274	.37065
Valid N (list wise)		

Source: Survey Results

Note:f_rep – faithful representation, nue- neutrality, ver- verifiability, rel_fv- feedback value, rel_pv – predictive value, arelevance – aggregate value of relevance

6.7.1 One Sample T-Test

The mean value and the standard deviation of reliability and relevance are measured for the purpose of one sample T-Test. The mean value and the standard deviation of faithful representation are 2.7823 and .46182 respectively. On the other hand, the mean value and the standard deviation of relevance are 4.4274 and .37065 (higher as compared with reliability). The mean value and the standard deviation of all the 25 individual statements have been calculated, which is given in table 6.40 (given in an-nexe-5:

The mid value 3 (neutral value) has been considered as the test value for one sample test. The researcher would like to see whether the response value is greater or lower than the mid value in order to measure the level of agreement or disagreement of the respondents at 95% confidence level. It is seen from the following table the majority of the values are greater than the mid value i.e., the level of agreement gets higher.

Table 6.40: One-Sample Test

	Test Value = 3					
					95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
ERP adoption increases managerial access to information	1.622	30	.115	.32258	-.0835	.7287
ERP adoption increases the extent of managerial discretion	1.622	30	.115	.32258	-.0835	.7287
ERP adoption facilitates the CEO and the CFO to certify that their company's financial statements and accompanying disclosures fairly represent the results of operation	3.724	30	.001	.67742	.3059	1.0489
ERP adoption facilitates the preparation of internal control report by management, management assertion as to the effectiveness of the firm's internal control structure in the report	4.062	30	.000	.70968	.3529	1.0665
ERP adoption facilitates the disclosure of firm's compliance with Company's Act 1994, IFRS, SEC guidelines and other relevant applicable laws	4.443	30	.000	.74194	.4009	1.0830
ERP decreases adequate separation of duties	-2.344	30	.026	-.38710	-.7243	-.0499
ERP decreases proper authorization of transactions and activities	-4.249	30	.000	-.61290	-.9075	-.3183
ERP decreases adequate documents and records	-5.343	30	.000	-.74194	-1.0256	-.4583
ERP decreases physical control over assets and records	-6.384	30	.000	-.80645	-1.0644	-.5485
ERP decreases independent checks on performance	-6.384	30	.000	-.80645	-1.0644	-.5485
ERP decreases the effectiveness of audit mechanisms	-7.233	30	.000	-.87097	-1.1169	-.6251
ERP decreases the effectiveness of internal control mechanisms	-17.294	30	.000	-1.16129	-1.2984	-1.0242

ERP increases the possibility that reported facts may influence the investor\s opinion or behavior	-18.447	30	.000	-1.12903	-1.2540	-1.0040
ERP adoption decreases the extent of consensus of accounting measures among different observers	-7.660	30	.000	-.93548	-1.1849	-.6861
ERP adoption decreases the assurance of correspondence of accounting information to economic events	-7.660	30	.000	-.93548	-1.1849	-.6861
ERP adoption decreases the number of direct verification in different items	-6.356	30	.000	-.83871	-1.1082	-.5692
ERP adoption increases the number of indirect verification to different items	-6.356	30	.000	-.83871	-1.1082	-.5692
ERP provides information that is adequate in assessing whether reported results confirm previous expectations of users	9.848	30	.000	1.32258	1.0483	1.5969
ERP provides feedback to users as to how various market events and significant transactions affected the company	9.848	30	.000	1.32258	1.0483	1.5969
ERP provides information that is useful in assessing the likely levels of recurringearnins., the company's sustainable earnings potential	13.830	30	.000	1.38710	1.1823	1.5919
ERP permits users to identify and assess the differing opportunities and risks contained within the company's various businesses	13.616	30	.000	1.32258	1.1242	1.5210
ERP adoption increases the predictive value of accounting information	13.616	30	.000	1.32258	1.1242	1.5210
ERP increases timeliness for complying with SEC filing requirements/ publication of annual and interim reports	18.137	30	.000	1.61290	1.4313	1.7945

ERP adoption enables the company management to publish its financial statements earlier as compared with its competitor	18.137	30	.000	1.61290	1.4313	1.7945
ERP enables the management to find new ways of communicating financial information	18.137	30	.000	1.61290	1.4313	1.7945
ERP adoption increases timeliness of reporting	17.545	30	.000	1.58065	1.3967	1.7646
f_rep	-2.625	30	.013	-.21774	-.3871	-.0483
neu	-18.447	30	.000	-1.12903	-1.2540	-1.0040
ver	-7.268	30	.000	-.88710	-1.1364	-.6378
rel_fv	9.848	30	.000	1.32258	1.0483	1.5969
rel_pv	14.092	30	.000	1.35484	1.1585	1.5512
time	18.212	30	.000	1.60484	1.4249	1.7848
arelevance	21.442	30	.000	1.42742	1.2915	1.5634

Source: Survey Results

Note: f_rep – faithful representation, nue- neutrality, ver- verifiability, rel_fv- feedback value, rel_pv – predictive value, arelevance – aggregate value of relevance

6.7.2 Independent Sample T-Test

The researcher has conducted an independent sample t-test at 5% significance level to measure whetherERP experience (The professional accountant has experience at least in a single firm) has created any difference in the response they made. As the value of significance is more than .05 in the independent sample test table (Mean = 2.2022 for professional accountants having ERP experience and Mean = 2.3291 for professional accountants having no ERP experience), the null hypothesis is accepted i.e., there is no statistically significant relationship between the responses made by the two groups.

It is observed from the analysis that ERP experience did not affect their responses i.e., professional accountants responded in the consistent manner irrespective of their ERP experience.

Table 6.41: Group Statistics

	ERP Experience	N	Mean	Std. Deviation	Std. Error Mean
ERP adoption increases managerial access to information	Yes	18	3.2778	1.12749	.26575
	No	13	3.3846	1.12090	.31088
ERP adoption increases the extent of managerial discretion	Yes	18	3.2778	1.12749	.26575
	No	13	3.3846	1.12090	.31088
ERP adoption facilitates the CEO and the CFO to certify that their company's financial statements and accompanying disclosures fairly represent the results of operation	Yes	18	3.8889	.83235	.19619
	No	13	3.3846	1.19293	.33086
ERP adoption facilitates the preparation of internal control report by management, management assertion as to the effectiveness of the firm's internal control structure in the report	Yes	18	3.8889	.83235	.19619
	No	13	3.4615	1.12660	.31246
ERP adoption facilitates the disclosure of firm's compliance with Companies Act 1994, IFRS, SEC guidelines and other relevant applicable laws	Yes	18	3.8889	.83235	.19619
	No	13	3.5385	1.05003	.29123
ERP decreases adequate separation of duties	Yes	18	2.6111	.97853	.23064
	No	13	2.6154	.86972	.24122
ERP decreases proper authorization of transactions and activities	Yes	18	2.2778	.75190	.17723
	No	13	2.5385	.87706	.24325

ERP decreases adequate documents and records	Yes	18	2.1667	.78591	.18524
	No	13	2.3846	.76795	.21299
ERP decreases physical control over assets and records	Yes	18	2.0556	.63914	.15065
	No	13	2.3846	.76795	.21299
ERP decreases independent checks on performance	Yes	18	2.0556	.63914	.15065
	No	13	2.3846	.76795	.21299
ERP decreases the effectiveness of audit mechanisms	Yes	18	2.0556	.63914	.15065
	No	13	2.2308	.72501	.20108
ERP decreases the effectiveness of internal control mechanisms	Yes	18	1.8333	.38348	.09039
	No	13	1.8462	.37553	.10415
ERP increases the possibility that reported facts may influence the investor\s opinion or behavior	Yes	18	1.8333	.38348	.09039
	No	13	1.9231	.27735	.07692
ERP adoption decreases the extent of consensus of accounting measures among different observers	Yes	18	1.9444	.41618	.09809
	No	13	2.2308	.92681	.25705
ERP adoption decreases the assurance of correspondence of accounting information to economic events	Yes	18	1.9444	.41618	.09809
	No	13	2.2308	.92681	.25705
ERP adoption decreases the number of direct verification in different items	Yes	18	2.0556	.53930	.12712
	No	13	2.3077	.94733	.26274
ERP adoption increases the number of indirect verification to different items	Yes	18	2.0556	.53930	.12712
	No	13	2.3077	.94733	.26274
ERP provides	Yes	18	4.3889	.50163	.11824

information that is adequate in assessing whether reported results confirm previous expectations of users	No	13	4.2308	1.01274	.28088
ERP provides feedback to users as to how various market events and significant transactions affected the company	Yes	18	4.3889	.50163	.11824
	No	13	4.2308	1.01274	.28088
ERP provides information that is useful in assessing the likely levels of recurringearnings. The company's sustainable earnings potential	Yes	18	4.2778	.46089	.10863
	No	13	4.5385	.66023	.18311
ERP permits users to identify and assess the differing opportunities and risks contained within the company's various businesses	Yes	18	4.2222	.42779	.10083
	No	13	4.4615	.66023	.18311
ERP increases timeliness for complying with SEC filing requirements/ publication of annual and interim reports	Yes	18	4.7222	.46089	.10863
	No	13	4.4615	.51887	.14391
ERP adoption enables the company management to publish its financial statements earlier as compared with its competitor	Yes	18	4.7222	.46089	.10863
	No	13	4.4615	.51887	.14391
ERP enables the	Yes	18	4.7222	.46089	.10863

management to find new ways of communicating financial information	No	13	4.4615	.51887	.14391
ERP adoption increases timeliness of reporting	Yes	18	4.6667	.48507	.11433
	No	13	4.4615	.51887	.14391
f_rep	Yes	18	2.7731	.46072	.10859
	No	13	2.7949	.48186	.13365
neu	Yes	18	1.8333	.38348	.09039
	No	13	1.9231	.27735	.07692
ver	Yes	18	2.0000	.45374	.10695
	No	13	2.2692	.90405	.25074
rel_fv	Yes	18	4.3889	.50163	.11824
	No	13	4.2308	1.01274	.28088
rel_pv	Yes	18	4.2500	.42875	.10106
	No	13	4.5000	.64550	.17903
time	Yes	18	4.7083	.45576	.10742
	No	13	4.4615	.51887	.14391
arelevance	Yes	18	4.4491	.23069	.05437
	No	13	4.3974	.51612	.14315

Source: Survey Results

Note: f_rep – faithful representation, nue- neutrality, ver- verifiability, rel_fv- feedback value, rel_pv – predictive value, arelevance – aggregate value of relevance

Table 6.42: Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
ERP adoption increases managerial access to information	Equal variances assumed	.018	.895	-.261	29	.796	-.10684	.40939	-.94413	.73046
	Equal variances not assumed			-.261	26.106	.796	-.10684	.40899	-.94736	.73368
ERP adoption increases the extent of managerial discretion	Equal variances assumed	.018	.895	-.261	29	.796	-.10684	.40939	-.94413	.73046
	Equal variances not assumed			-.261	26.106	.796	-.10684	.40899	-.94736	.73368
ERP adoption facilitates the CEO and the CFO to certify that their company's financial statements and accompanying disclosures fairly represent the results of operation	Equal variances assumed	7.056	.013	1.389	29	.175	.50427	.36306	-.23827	1.24682
	Equal variances not assumed			1.311	20.163	.205	.50427	.38465	-.29768	1.30623

…cont'd

ERP adoption facilitates the preparation of internal control report by management, management assertion as to the effectiveness of the firm's internal control structure in the report	Equal variances assumed	4.503	.042	1.217	29	.234	.42735	.35126	-.29105	1.14575
	Equal variances not assumed			1.158	21.020	.260	.42735	.36895	-.33987	1.19457
ERP adoption facilitates the disclosure of firm's compliance with Companies Act 1994, IFRS, SEC guidelines and other relevant applicable laws	Equal variances assumed	2.739	.109	1.037	29	.308	.35043	.33800	-.34086	1.04172
	Equal variances not assumed			.998	22.144	.329	.35043	.35114	-.37753	1.07838
ERP decreases adequate separation of duties	Equal variances assumed	.761	.390	-.013	29	.990	-.00427	.34033	-.70033	.69178
	Equal variances not assumed			-.013	27.655	.990	-.00427	.33374	-.68829	.67974
ERP decreases proper authorization of transactions and activities	Equal variances assumed	1.216	.279	-.889	29	.382	-.26068	.29338	-.86072	.33935
	Equal variances not assumed			-.866	23.456	.395	-.26068	.30097	-.88261	.36124
ERP decreases adequate documents and records	Equal variances assumed	.445	.510	-.769	29	.448	-.21795	.28336	-.79749	.36160
	Equal variances not assumed			-.772	26.370	.447	-.21795	.28227	-.79778	.36188

…cont'd

ERP decreases physical control over assets and records	Equal variances assumed	2.911	.099	-1.300	29	.204	-.32906	.25309	-.84668	.18856
	Equal variances not assumed			-1.261	22.954	.220	-.32906	.26088	-.86879	.21067
ERP decreases independent checks on performance	Equal variances assumed	2.911	.099	-1.300	29	.204	-.32906	.25309	-.84668	.18856
	Equal variances not assumed			-1.261	22.954	.220	-.32906	.26088	-.86879	.21067
ERP decreases the effectiveness of audit mechanisms	Equal variances assumed	.962	.335	-.712	29	.482	-.17521	.24605	-.67843	.32801
	Equal variances not assumed			-.697	23.930	.492	-.17521	.25125	-.69386	.34343
ERP decreases the effectiveness of internal control mechanisms	Equal variances assumed	.035	.854	-.093	29	.927	-.01282	.13839	-.29586	.27022
	Equal variances not assumed			-.093	26.337	.927	-.01282	.13791	-.29611	.27047
ERP adoption decreases the representational faithfulness of accounting information	Equal variances assumed	5.825	.022	-1.849	29	.075	-.32479	.17563	-.68399	.03441
	Equal variances not assumed			-1.897	28.047	.068	-.32479	.17122	-.67549	.02592
ERP increases the possibility that reported facts may influence the investor\s opinion or behavior	Equal variances assumed	2.277	.142	-.718	29	.479	-.08974	.12505	-.34550	.16601
	Equal variances not assumed			-.756	28.995	.456	-.08974	.11869	-.33249	.15300
ERP adoption decreases the neutrality of accounting information	Equal variances assumed	.467	.500	-1.068	29	.294	-.26496	.24806	-.77230	.24239
	Equal variances not assumed			-.971	16.775	.345	-.26496	.27290	-.84132	.31141

…cont'd

ERP adoption decreases the extent of consensus of accounting measures among different observers	Equal variances assumed	2.846	.102	-1.164	29	.254	-.28632	.24605	-.78955	.21690
	Equal variances not assumed			-1.041	15.517	.314	-.28632	.27513	-.87106	.29841
ERP adoption decreases the assurance of correspondence of accounting information to economic events	Equal variances assumed	2.846	.102	-1.164	29	.254	-.28632	.24605	-.78955	.21690
	Equal variances not assumed			-1.041	15.517	.314	-.28632	.27513	-.87106	.29841
ERP adoption decreases the number of direct verification in different items	Equal variances assumed	2.423	.130	-.941	29	.354	-.25214	.26792	-.80010	.29583
	Equal variances not assumed			-.864	17.595	.399	-.25214	.29188	-.86636	.36209
ERP adoption increases the number of indirect verification to different items	Equal variances assumed	2.423	.130	-.941	29	.354	-.25214	.26792	-.80010	.29583
	Equal variances not assumed			-.864	17.595	.399	-.25214	.29188	-.86636	.36209
ERP adoption decreases the verifiability of accounting information	Equal variances assumed	.256	.617	-1.181	29	.247	-.29915	.25320	-.81700	.21871
	Equal variances not assumed			-1.056	15.507	.307	-.29915	.28317	-.90100	.30271
ERP provides information that	Equal variances assumed	7.586	.010	.574	29	.570	.15812	.27526	-.40484	.72108

…cont'd

is adequate in assessing whether reported results confirm previous expectations of users	Equal variances not assumed			.519	16.269	.611	.15812	.30475	-.48706	.80330
ERP provides feedback to users as to how various market events and significant transactions affected the company	Equal variances assumed	7.586	.010	.574	29	.570	.15812	.27526	-.40484	.72108
	Equal variances not assumed			.519	16.269	.611	.15812	.30475	-.48706	.80330
ERP adoption increases the feedback value of accounting information	Equal variances assumed	4.567	.041	.710	29	.483	.23504	.33091	-.44174	.91183
	Equal variances not assumed			.628	14.678	.540	.23504	.37445	-.56461	1.03469
ERP provides information that is useful in assessing the likely levels of recurring earnings., the company's sustainable earnings potential	Equal variances assumed	3.482	.072	-1.297	29	.205	-.26068	.20098	-.67173	.15036
	Equal variances not assumed			-1.224	20.170	.235	-.26068	.21291	-.70457	.18320
ERP permits users to identify	Equal variances assumed	6.599	.016	-1.226	29	.230	-.23932	.19521	-.63857	.15994

…cont'd

and assess the differing opportunities and risks contained within the company's various businesses	Equal variances not assumed			-1.145	19.138	.266	-.23932	.20904	-.67663	.19799
ERP adoption increases the predictive value of accounting information	Equal variances assumed	6.599	.016	-1.226	29	.230	-.23932	.19521	-.63857	.15994
	Equal variances not assumed			-1.145	19.138	.266	-.23932	.20904	-.67663	.19799
ERP increases timeliness for complying with SEC filing requirements/ publication of annual and interim reports	Equal variances assumed	2.743	.108	1.475	29	.151	.26068	.17679	-.10090	.62226
	Equal variances not assumed			1.446	24.058	.161	.26068	.18031	-.11141	.63277
ERP adoption enables the company management to publish its financial statements earlier as compared with its competitor	Equal variances assumed	2.743	.108	1.475	29	.151	.26068	.17679	-.10090	.62226
	Equal variances not assumed			1.446	24.058	.161	.26068	.18031	-.11141	.63277
ERP enables the management to find new ways of communicating financial information	Equal variances assumed	2.743	.108	1.475	29	.151	.26068	.17679	-.10090	.62226
	Equal variances not assumed			1.446	24.058	.161	.26068	.18031	-.11141	.63277

…cont'd

ERP adoption increases timeliness of reporting	Equal variances assumed	1.306	.262	1.129	29	.268	.20513	.18175	-.16659	.57684
	Equal variances not assumed			1.116	24.921	.275	.20513	.18380	-.17347	.58373
ERP adoption increases the timeliness of accounting information	Equal variances assumed	2.743	.108	1.039	29	.307	.18376	.17679	-.17782	.54534
	Equal variances not assumed			1.019	24.058	.318	.18376	.18031	-.18833	.55585
f_rep	Equal variances assumed	.022	.883	-.127	29	.900	-.02172	.17092	-.37129	.32784
	Equal variances not assumed			-.126	25.293	.901	-.02172	.17220	-.37617	.33272
neu	Equal variances assumed	2.277	.142	-.718	29	.479	-.08974	.12505	-.34550	.16601
	Equal variances not assumed			-.756	28.995	.456	-.08974	.11869	-.33249	.15300
ver	Equal variances assumed	2.301	.140	-1.092	29	.284	-.26923	.24656	-.77351	.23504
	Equal variances not assumed			-.988	16.381	.338	-.26923	.27259	-.84602	.30755
rel_fv	Equal variances assumed	7.586	.010	.574	29	.570	.15812	.27526	-.40484	.72108
	Equal variances not assumed			.519	16.269	.611	.15812	.30475	-.48706	.80330
rel_pv	Equal variances assumed	3.428	.074	-1.298	29	.205	-.25000	.19266	-.64403	.14403
	Equal variances not assumed			-1.216	19.470	.238	-.25000	.20558	-.67958	.17958
time	Equal variances assumed	3.075	.090	1.404	29	.171	.24679	.17576	-.11267	.60626
	Equal variances not assumed			1.374	23.868	.182	.24679	.17958	-.12395	.61754
arelevance	Equal variances assumed	4.090	.052	.377	29	.709	.05164	.13688	-.22831	.33159
	Equal variances not assumed			.337	15.485	.740	.05164	.15313	-.27385	.37713

Source: Survey Results

Note: f_rep – faithful representation, nue- neutrality, ver- verifiability, rel_fv- feedback value, rel_pv – predictive value, arelevance – aggregate value of relevance

6.7.3 ANOVA

The researcher has conducted an analysis of variance at 5% significance level to measure whether professionalexperience has created any difference in the response they made. As the value of significance for the faithful representation is greater than .05 in the ANOVAtable, the null hypothesis is accepted i.e., there is no statistically significant relationship between the responses made by the groups. Professional experience did not affect the responses made by the accountants with respect to faithful representation. But interestingly, with respect to neutrality, professional experience affected the responses made by the accountants.

As the value of significance for the aggregate value of relevance is greater than .05 in the ANOVA table, the null hypothesis is accepted i.e., there is no statistically significant relationship between the responses made by the o groups. Professional experience did not affect the responses made by the professional accountants with respect to relevance.

Table 6.43: ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
ERP adoption increases managerial access to information	Between Groups	8.078	3	2.693	2.533	.078
	Within Groups	28.697	27	1.063		
	Total	36.774	30			
ERP adoption increases the extent of managerial discretion	Between Groups	8.078	3	2.693	2.533	.078
	Within Groups	28.697	27	1.063		
	Total	36.774	30			
ERP adoption facilitates the CEO and the CFO to certify that their company's financial statements and accompanying disclosures fairly represent the results of operation	Between Groups	6.962	3	2.321	2.631	.070
	Within Groups	23.812	27	.882		
	Total	30.774	30			

…cont'd

ERP adoption facilitates the preparation of internal control report by management, management assertion as to the effectiveness of the firm's internal control structure in the report	Between Groups	5.908	3	1.969	2.366	.093
	Within Groups	22.479	27	.833		
	Total	28.387	30			
ERP adoption facilitates the disclosure of firm's compliance with Companies Act 1994, IFRS, SEC guidelines and other relevant applicable laws	Between Groups	5.012	3	1.671	2.156	.116
	Within Groups	20.923	27	.775		
	Total	25.935	30			
ERP decreases adequate separation of duties	Between Groups	4.569	3	1.523	1.978	.141
	Within Groups	20.786	27	.770		
	Total	25.355	30			
ERP decreases proper authorization of transactions and activities	Between Groups	1.889	3	.630	.973	.420
	Within Groups	17.466	27	.647		
	Total	19.355	30			
ERP decreases adequate documents and records	Between Groups	2.624	3	.875	1.542	.226
	Within Groups	15.312	27	.567		
	Total	17.935	30			
ERP decreases physical control over assets and records	Between Groups	1.749	3	.583	1.203	.328
	Within Groups	13.090	27	.485		
	Total	14.839	30			
ERP decreases independent checks on performance	Between Groups	1.749	3	.583	1.203	.328
	Within Groups	13.090	27	.485		
	Total	14.839	30			

…cont'd

ERP decreases the effectiveness of audit mechanisms	Between Groups	1.505	3	.502	1.131	.354
	Within Groups	11.979	27	.444		
	Total	13.484	30			
ERP decreases the effectiveness of internal control mechanisms	Between Groups	.946	3	.315	2.621	.071
	Within Groups	3.248	27	.120		
	Total	4.194	30			
ERP increases the possibility that reported facts may influence the investor\s opinion or behavior	Between Groups	1.005	3	.335	3.650	.025
	Within Groups	2.479	27	.092		
	Total	3.484	30			
ERP adoption decreases the extent of consensus of accounting measures among different observers	Between Groups	.897	3	.299	.622	.607
	Within Groups	12.974	27	.481		
	Total	13.871	30			
ERP adoption decreases the assurance of correspondence of accounting information to economic events	Between Groups	.897	3	.299	.622	.607
	Within Groups	12.974	27	.481		
	Total	13.871	30			
ERP adoption decreases the number of direct verification in different items	Between Groups	1.202	3	.401	.722	.548
	Within Groups	14.991	27	.555		
	Total	16.194	30			
ERP adoption increases the number of indirect verification to different items	Between Groups	1.202	3	.401	.722	.548
	Within Groups	14.991	27	.555		
	Total	16.194	30			

…cont'd

ERP provides information that is adequate in assessing whether reported results confirm previous expectations of users	Between Groups	1.582	3	.527	.937	.436
	Within Groups	15.192	27	.563		
	Total	16.774	30			
ERP provides feedback to users as to how various market events and significant transactions affected the company	Between Groups	1.582	3	.527	.937	.436
	Within Groups	15.192	27	.563		
	Total	16.774	30			
ERP provides information that is useful in assessing the likely levels of recurringearnings., the company's sustainable earnings potential	Between Groups	1.992	3	.664	2.434	.087
	Within Groups	7.363	27	.273		
	Total	9.355	30			
ERP permits users to identify and assess the differing opportunities and risks contained within the company's various businesses	Between Groups	.744	3	.248	.834	.487
	Within Groups	8.030	27	.297		
	Total	8.774	30			
ERP increases timeliness for complying with SEC filing requirements/ publication of annual and interim reports	Between Groups	1.069	3	.356	1.530	.229
	Within Groups	6.286	27	.233		
	Total	7.355	30			

…cont'd

ERP adoption enables the company management to publish its financial statements earlier as compared with its competitor	Between Groups	1.069	3	.356	1.530	.229
	Within Groups	6.286	27	.233		
	Total	7.355	30			
ERP enables the management to find new ways of communicating financial information	Between Groups	1.069	3	.356	1.530	.229
	Within Groups	6.286	27	.233		
	Total	7.355	30			
ERP adoption increases timeliness of reporting	Between Groups	1.262	3	.421	1.807	.170
	Within Groups	6.286	27	.233		
	Total	7.548	30			
f_ rep	Between Groups	.338	3	.113	.502	.684
	Within Groups	6.060	27	.224		
	Total	6.398	30			
neu	Between Groups	1.005	3	.335	3.650	.025
	Within Groups	2.479	27	.092		
	Total	3.484	30			
ver	Between Groups	.992	3	.331	.694	.564
	Within Groups	12.863	27	.476		
	Total	13.855	30			
rel_fv	Between Groups	1.582	3	.527	.937	.436
	Within Groups	15.192	27	.563		
	Total	16.774	30			
rel_pv	Between Groups	1.289	3	.430	1.588	.215
	Within Groups	7.308	27	.271		
	Total	8.597	30			

…cont'd

time	Between Groups	1.109	3	.370	1.632	.205
	Within Groups	6.113	27	.226		
	Total	7.222	30			
	Total	2.871	30			
arelevance	Between Groups	.511	3	.170	1.273	.304
	Within Groups	3.611	27	.134		
	Total	4.121	30			

Source: Survey Results

Note: f_rep – faithful representation, nue- neutrality, ver- verifiability, rel_fv- feedback value, rel_pv – predictive value, arelevance – aggregate value of relevance

6.8 Summary of the Results on Hypotheses Testing and Explanations Thereto

All the hypotheses have been tested in this chapter. A summary of the results of the hypotheses testing is given below:

Qualitative characteristics	**Results on Null Hypotheses Testing**		**Explanation of the test results**
	ERP-adopter	**ERP non-adopters**	
Representational faithfulness and verifiability (examined by using Modified Jones Model based on total accruals)	$H_0$1 and $H_0$2 not rejected	$H_0$1 and $H_0$2 rejected	In case of ERP-adopters, ERP implementations have no significant effect on the faithful representation and verifiability of accounting information. But in case of ERP non-adopters, faithful representation and verifiability may be declined on ERP implementations.
Representational faithfulness and verifiability (examined by using Extended Modified Jones Model based on total accruals)	$H_0$1 and $H_0$2 rejected	$H_0$1 and $H_0$2 rejected	ERP implementations decrease the faithful representation of accounting information.
Neutrality	$H_0$3 not rejected	$H_0$3 not rejected	ERP implementations have no significant effect on the neutrality of accounting information.
Timeliness	$H_0$4 not rejected	$H_0$4 not rejected	ERP implementations have no significant effect on the timeliness of accounting information.
Feedback value	$H_0$5.1 rejected	$H_0$5.1 rejected	ERP implementations increase the feedback value of accounting information.
Predictive value	$H_0$5.2 rejected	$H_0$5.2 rejected	ERP implementations increase the predictive value of accounting information.

As per the above findings, except in case of representational faithfulness and verifiability of accounting information, while examined by using Modified Jones Model based on total accruals, there is no difference in results between the ERP-adopters and non-adopters, which is apparently difficult to accept. The possible reasons to this unusual results might be insufficiency of data based on a very limited number of companies and the annual reports, the source of secondary data, are the general-purpose financial statements prepared through traditional management and accounting information systems with a large time lag, which is substantiated by the mean value of reporting lag (158 days for ERP-adopters and 163 days for non-adopters) and they are not the outcome of the ERP systems.

6.9 Findings of the Study

6.9.1 Fundamental Qualitative Characteristics of Accounting Information

An attempt was made in the present study to examine the impact of ERP implementations on the faithful representation of accounting information using modified Jones model and extended modified Jones model. The findings of the modified Jones model indicate that ERP implementations in the respective firms do not decrease faithful representation (Table 6.2 and 6.5). This finding was different from the existing literature. Existing literature reveals that ERP usage decreases the faithful representation of accounting information.

It is found from the survey and discussion with the experts that there is higher agreement with the few reliability statement items such as, “ERP increases managerial access to accounting information”, “ERP increases the extent of managerial discretion” etc. But in contrast with the existing literature, ERP does not decrease the effectiveness of internal control mechanism and audit mechanism. ERP integrates everything in a single system. As compared with the legacy system, ERP is enriched with unique security and control features as well. Moreover, ERP ensures adequate separation of duty. Bangladesh is in its infancy stage with respect to ERP. For this, corporate managers may not be able to manage earnings through ERP system. Consequently, the findings reveal that ERP does not decrease reliability.

Interestingly, it is found from the extended modified Jones model that implementing ERP negatively affects faithful representation i.e., ERP implementation decreases faithful representation of accounting information, which is consistent with the existing literature.

An additional survey was conducted with the professional accountants in order to justify the finding of the researcher. It was found in the survey that the level of agreement of the respondents with reliability items gets higher which indicates that ERP usage decreases faithful representation.

It is evident from the study Implementing ERP does not decrease neutrality of accounting information (which is an ingredient of faithful representation). The survey result is not consistent with this finding. The survey finding is that implementing ERP decreases neutrality of accounting information.

The researcher also examined the effect of ERP implementations on the relevance of accounting information with reference to feedback value and predictive value. The findings of the study reveal that ERP usage increases relevance with respect to feedback value of accounting information (Table 6.15). It was also found that ERP usage increases relevance with respect to predictive value (Table 6.11).

The survey results indicate that the level of agreement of the respondents with relevance items gets higher which indicates that ERP usage increases relevance with respect to feedback value and predictive value.

6.9.2 Enhancing Qualitative Characteristics of Accounting Information

Two significant qualitative characteristics that enhance the fundamental qualitative characteristics of accounting information have been considered in the study: timeliness and verifiability.

It is observed that ERP usage does not increase relevance with respect to timeliness (Table 6.20 and 6.21). The reporting lag between the ERP –adopting firms and the non-adopting firms are

mathematically significant but statistically not significant (The mean values of reporting lag of ERP user firms and ERP non-user firms are 158 days and 163 days approximately).

The reason for an insignificant increase in the reporting lag (timeliness) on ERP implementation is evident from the opinions of the professional accountants (having familiarity with the ERP software). After the closure of the accounting period, the management (BOD) prepares the accounts and places them before the auditors. Auditors conduct the audit and recommend the management for adjustments and corrections (if there is any). Management makes the adjustments and corrections and presents the financial statements to the auditors. Auditors finalize the audit report and place it before the management. Managers place it during the AGM for the formal approval of shareholders. ERP facilitates the management prepare the financial statements and helps the auditors to conduct verification/checking of different transactions. The process of preparing accounts and audit are facilitated in ERP-adopting firms but still the reporting of audited financial statements in the form of annual report is a time-consuming process where ERP software actually does not play much role. Firstly, management has to organize and place many issues in the annual report such as Directors' report, summary of operating and financial data, value added statement, different types of compliance report including Corporate Governance etc. Organization of such issues requires time, which is not actually lessened by ERP adoption. Secondly, auditors have to form an audit opinion for which s/he has to analyze, review, observe and apply her/his professional judgment. The time required to accomplish this process of audit is not lessened on ERP implementation.

The Modified Jones model and the extended modified Jones model give two contrasting finding. The findings of the modified Jones model is that implementing ERP does not decrease verifiability whereas the extended modified Jones model shows that verifiability is declined on ERP implementation.

6.9.3 Decision Usefulness of Accounting Information and feasibility of ERP Implementation

The major findings of the study using modified Jones model indicate that ERP implementation does not decrease faithful representation and verifiability which is different from the existing literature. The opinion survey gives a contrasting result i.e., ERP usage decreases faithful

representation and verifiability supporting the existing literature. The finding of the opinion survey is also consistent with the extended modified Jones model.

ERP usage increases relevance of accounting information with respect to predictive value and feedback value. But surprisingly, ERP usage does not increase timeliness. The opinion survey shows that ERP implementation increases relevance with respect to predictive value, feedback value and timeliness. Both of these results are consistent with the existing literature.

Corporate entities now may have to make a trade-off between faithful representation and relevance to determine the feasibility of implementing ERP from the view of decision-usefulness of accounting information. As ERP implementation is not feasible from faithful representation view of accounting information whereas it is feasible from relevance view of accounting information.

6.9.4 Earnings Management

As the extended modified Jones model is more suitable in context of Bangladesh rather than modified Jones model, the findings of the extended modified Jones model is significant in the issue of earnings management. The findings of the extended modified Jones model shed light on the issue that implementing ERP helps corporate managers to manage earnings as faithful representation is declined on ERP implementation, which is also supported by the opinion survey.

6.9.5 ERP Experience

It is further observed from the analysis that ERP experience did not affect the responses i.e., professional accountants responded in the consistent manner irrespective of their ERP experience (Table 6.31).

6.9.6 Professional Experience

There is statistically significant relationship between the responses made by the groups with respect to reliability items i.e., professional experience affected the responses made by the

accountants with respect to faithful representation, whereas there is no statistically significant relationship between the responses made by the groups with respect to relevance items. Professional experience did not affect the responses made by the professional accountants with respect to relevance (Table 6.33).

6.10 Effects of Implementing ERP on Accounting Information–An empirical Explanation Using Institutional Theory

Throughout the process of ERP implementations, support and commitment of the top management is essential. ERP implementations generally have to undergo the following process:

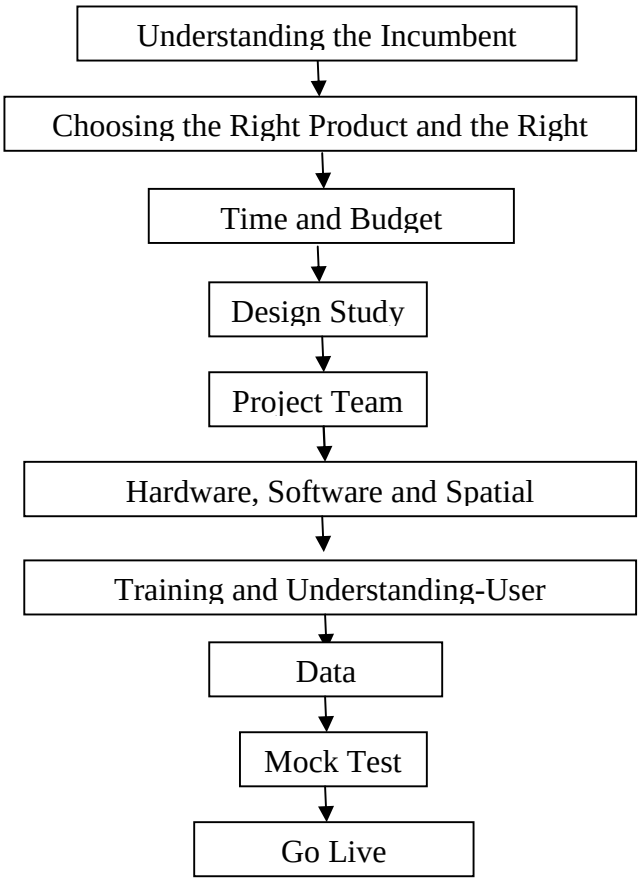


Figure 6.1: ERP Implementations Process

During the project team build-up, the functional level i.e., departmental managers have to actively take part in the implementation process of ERP. With respect to ERP implementation in context of Bangladesh, technology providers, top management, board members, and the

stakeholders are the actors who can play important roles in shaping ERP in the organization. Top management who has access to ERP cannot explore the maximum benefits as they are not used to operate the software and they have to depend on the technology providers for training or consultation at the initial stage. Gradually top management being forced by normative and cognitive institutional pressures and competitive pressures (leading to isomorphism) takes an active role in managing the organization in ERP settings. The researcher has applied the isomorphism view of institutional theory in this study. This is why; managers ultimately manage earnings in an ERP setting smoothly. It is evident from the research findings that ERP implementations reduce the faithful representation and verifiability of accounting information which signals earnings management by the top management.

Chapter 7

SUMMARY, CONCLUSIONS AND IMPLICATIONS

SUMMARY, CONCLUSIONS AND IMPLICATIONS

This chapter deals with the summary, conclusions and implications for future research.

7.1 Summary of the Findings of the Study

The ERP practice in the corporate sectors of Bangladesh is relatively new. Giant and multinational companies are practicing ERP instead of legacy systems recently. Again many large companies are claiming that they are using ERP-based software, which is not truly ERP. Tally.ERP 9 (a software developed by an Indian multinational company Tally Solutions Pvt. Ltd.) can be the suitable example for this. Since ERP is in its infancy stage (since December 2011, only 14 non-financial firms have adopted full version of ERP systems), managers may not fully interact with the ERP system and explore all the benefits of the system. The successful implementation of ERP system is still a challenge to the corporate managers all over the world. Financial modules are lying at the heart of ERP system. Naturally the impact of ERP implementations on the accounting information particularly with respect to faithful representation and relevance is an arena, which needs to be explored in context of developing countries like Bangladesh. This will also unveil the issue of earnings management in context of Bangladesh.

The researcher tried to reveal the impact of ERP implementation on accounting information. For doing so, several models were developed and tested between a number of ERP-adopting and non-adopting firms. The study is exploratory and the researcher's survey-based list of ERP-adopting firms will be treated as a sampling frame. Since the ready-made sampling frame of the ERP-adopting firms is not available, a survey has been undertaken through telephone-interview using the phone numbers mentioned in the address-database of the listed entities published by the DSE in their monthly publications and available in the DSE's website. During July-December 2011, the researcher contacted all the listed firms (enlisted with DSE up to December 2010) through telephone calls. Primarily, data were collected from annual reports of 16 years of the respective ERP-adopting and non-adopting firms. Annual reports were collected from SECB and the share division of the respective companies. Later, the researcher also conducted an opinion survey by using a structured questionnaire based on 5-point Likert scale with the professional accountants (auditors). Most of them have familiarity with ERP software.

The data collected for the present study were processed through microcomputer using Statistical Package for Social Science (SPSS). The researcher himself tabulated the data. Before feeding the data into computer, all data were converted into numerical codes and details of this coding were recorded in separate sheets.

For the purpose of data analysis, Descriptive statistics, Standard multiple regressions, Chi-square test, Auto regression, Independent sample t-test, ANOVA etc. were done.

The findings of the study indicate that ERP implementations in the respective firms decrease faithful representation including neutrality of accounting information. This finding is similarto the existing literature. Existing literature reveals that ERP usage decreases the reliability of accounting information.

It was found in the survey that the level of agreement of the respondents with faithful representation items gets higher which indicates that ERP usage decreases faithful representation. The findings further reveal that ERP usage increases feedback value and predictive value of accounting information. But ERP usage does not increase timeliness of accounting information. The survey results indicate that the level of agreement of the respondents with relevance items gets higher which indicates that ERP usage increases relevance (with respect to feedback value and predictive value) and timeliness.

Finally, it was seen that ERP experience does not make any difference in the responses made by the professional accountants whereas professional experience makes difference in their responses with respect to faithful representation and relevance statement items.

7.2 Conclusions and Implications

The research findings reveal the fact that ERP implementation does not affect faithful representation and neutrality of accounting information negatively. Besides, ERP implementation positively affects feedback value and predictive value of relevance.

Threesignificant findings merit attention. Firstly, ERP implementation does not affect faithful representation (modified Jones model) whereas faithfulness of the accounting information is declined on ERP adoption as per extended modified Jones model supporting the finding of the opinion survey and the existing literature.

Secondly, it is evident from the study that ERP implementations encourage earnings management.

Thirdly, ERP implementation does not increase timeliness which is the most important enhancing qualitative characteristics. The reporting lag is not significantly declined on ERP implementation.

7.3 Directions for Future Research

The findings have implications for future research and individuals involved with ERP system implementations.

First, the models used in this study can be used to test the impact of ERP implementation on accounting information based on pre- ERP adoption and post-ERP adoption, which is not possible in the current study due to lesser number of ERP adoption in Bangladesh.

Second, the models can be developed so that the non-financial firms may be taken into consideration for further study.

Third, extensive study can be made as to why the reliability of accounting information is not declined due to ERP implementation.

Fourth, additional study could attempt to find out the reason for an insignificant increase in timeliness of accounting information.

Fifth, future research looking into the relationship between ERP and performance may want to use non-financial variables (e.g., number of facilities, new products, and customer satisfaction ratings) to complement financial measures when measuring operational improvement.

Sixth, the impact of ERP implementations can also analyzed with respect to non-accounting perspectives.

Seventh, faithful representation and relevance – as both are subjective, perception study is best suited and this type of perception study can be extended to chief financial officers (CFO), regulators and to ERP experts or consultants for further study.

Eighth, ERP-adopting and non-adopting firms are not match paired because of small sample size based on similar characteristics.

Ninth, all the ingredients of faithful representation, relevance and enhancing qualitative characteristics have not been taken into account in the present study, which might be covered in the future study.

-----: :-----

Bibliography

AAA (American Accounting Association). 1977. *Statement of Accounting Theory and Theory Acceptance* (Sarasota, Florida, USA: American Accounting Association).

AAA (American Accounting Association). 1966. *A Statement of Basic Accounting Theory*. Evanston, Illinois, USA: American Accounting Association.

Akers, M. D., D. E. Giacomino and J. L Bellovary. 2007. Earnings Management and Its Implications: Educating the Accounting Profession. *The CPA Journal*, 77(8): 64-68.

Al-Mashari, M. 2002. Enterprise resource planning (ERP): A research agenda. *Industrial Management and Data Systems*, 102:165-70.

Altamuro, J. A.L. Beatty, and J. Weber. 2005. The effects of accelerated revenue recognition on earnings management and earnings informativeness: Evidence from SEC Staff Accounting Bulletin No. 101. *The Accounting Review*, 80(2): 373-401.

Alvarez, R. 2002. The Myth of Integration: A Case Study of an ERP Implementation, in F.F.H. Nah (ed.) *Enterprise Resource Planning Solutions and Management*, Hershey, Pennsylvania, USA: Idea Group Inc. (IGI).

Alzoubi, A. 2011.The effectiveness of the accounting information system under the Enterprise Resource Planning (ERP).*Research Journal of Finance and Accounting*, 2(1):10-18.

Amoah, N. Y., I. Bonaparte and A. P. Tang. 2012. Internal Control Material Weakness and Managerial Manipulation of Operational Decisions. Available at http://sfm.finance.nsysu.edu.tw/pdf/2014pdf/004-1778011221.pdf; accessed on 12.06.2013.

AICPA (American Institute of Certified Public Accountants). 2002. Statement on Auditing Standards No. 99: Consideration of Fraud in a Financial Statement Audit. New York, USA: AICPA.

Attayah, O. F. and I. M. Sweiti. 2014. Impact of ERP systems using on the accounting information relevance: Evidence from Saudi Arabia. *Journal on Business Review*, 3(2).

Bala, S. K. 2012. The New Conceptual Framework for Financial Reporting 2010: Some Reflective Comments, *Independent Business Review*, 5(2): 1-25.

Barua, A. 2005. Using the FASB's Qualitative Characteristics in Earnings Quality Measures. available at http://etd.lsu.edu/docs/available/etd-03172006-101515/unrestricted/Barua_dis.pdf; accessed on 12.06.2013.

Bartholomew, D. 1997. Promise vs. reality. *Industry Week* (November 3): 26–30.

Beard, J.W. and M. Sumner. 2004. Seeking strategic advantage in the post–net era: viewing ERP systems from the resource-based perspective. *The Journal of Strategic Information Systems*, 13 (2):129–150.

Beath, C. A. 2000. Supporting the Information Technology Champion. *MIS Quarterly*, 15 (3): 355-372.

Becker, C. L., M. L. DeFond, J. Jiambalvo, and K. R. Subramanyam. 1998. The effect of audit quality on earnings management. *Contemporary Accounting Research*,15 (1): 1–21.

Beheshti, H. M. 2006. What managers should know about ERP/ERPII.*Management Research News*, 29 (4): 184-193.

Belkaoui, A. 2000.*Accounting Theory*. London: Thomson Learning, 4th Edition.

Berchet, C. and G. Habchi. 2005. The implementation and deployment of an ERP system: An industrial case study. *Computers in Industry*, 56: 588-605.

Berente, N., K. Lyytinen and Y. Yoo. 2007. An institutional analysis of pluralistic responses to enterprise system implementations. *Proceedings of International Conference on Information Systems*, Montreal, Quebec, Canada, Dec. 9-12, 2007.

Berger, P. L. and T. Luckmann. 1966. *The Social Construction of Reality: A Treatise in the Sociology of Knowledge*. New York: Doubleday.

Bharath, S. T., J. Sunder, and S. Sunder V. 2004. Accounting quality and debt contracting.*Working Paper*. Ann Arbor, Michigan: University of Michigan.

Billah, A. B. M. M., C. Puttee, and Y. Ali. 2008. Consideration of critical success factors for Enterprise Resource Planning systems implementation in context of Bangladesh. *The Cost and Management*. July-August, 17.

Booth, P., Z. Matolcsy, and B. Wieder. 2000. The impact of enterprise resource systems on accounting practice-The Australian experience. *Australian Accounting Review*, 10(3): 774-779.

Braddord, and J. Florin. 2003. Examining the role of innovation diffusion factors on the implementation success of enterprise resource planning systems. *International Journal of Accounting InformationSystems*, 4: 205–225.

Bradford, M. and F. D. Roberts. 2001. Measuring value in ERP installations. *Strategic Finance*, (September): 30-34.

Brazel, J. F. and L. Dang. 2005. The Effect of ERP System Implementations on the Usefulness of Accounting Information. *Managerial Audit Journal*, 20 (6): 619-631.

Brazel, J. F. and L. Dang. 2008. The effect of ERP system implementations on the management of earnings and earnings release dates. *Journal of Information Systems*, 22(2): 1-21.

Brehm, N. and J. M. Gomez. 2010. Federated ERP-systems on the basis of Web services and P2P networks. *International Journal of Information Technology and Management*, 9(1): 75-89.

Brown, L. D. 1997. Analyst forecasting errors: Additional evidence, *Financial Analysts Journal*, 53(6): 81-88.

Brown, L.D. and M; L. Caylor. 2005. A temporal analysis of quarterly earnings thresholds: propensity and valuation consequences. *The Accounting Review*, 80(2): 423-440.

Brownlee, E.R., K.R Ferris, and M.E. Haskins. 2001. *Corporate financial reporting*. New York: McGraw Hill.

Caldwell, B. and T. Stein. 1998. Beyond ERP–New IT Agenda–Second Wave of ERP. *Information Week*, (Nov.): 29-32.

Carr, N.G. 2003. IT doesn't matter. *Harvard Business Review*, 81(5): 41-49.

Carr, N.G. 2004. *Does IT Matter? Information Technology and the Corrosion of Competitive Advantage*. Boston, Massachusetts, USA: Harvard Business School Press.

Cerullo, M. J. and V. Cerullo. 2000. The internal auditor's role in developing and implementing enterprise resource planning systems. *Internal Auditing* (May/June): 25-34. Challenges on a global implementation of ERP software, Engineering Management Conference: IEMC 2002, August 18-20, 2002.

Chai, M. L. and S. Tung. 2002. The effect of Earnings- Announcement Timing on Earnings *Management. Journal of Business Finance and Accounting*, 29(9-10).

Chand, D., G. Hachey, J. Hunton, V. Owhoso and S. Vasudevan, 2005. A balanced scorecard based framework for assessing the strategic impacts of ERP systems. *Computers in Industry*, 56: 558-572.

Chen, I. 2001. Planning for ERP systems: Analysis and future trend. *Business Process Management Journal*, 7(5): 374-386.

Chiplunkar, C., S.G. Deshmukh and R. Chattopadhyay. 2003. Application of principles of event related open systems to business process reeenineering, *Computers and Industrial Engineering*, 45(3): 347-374.

Christensen, J. 2010. Conceptual frameworks of accounting from an information perspective.*Accounting and Business Research*, 40(3): 287-299.

Cronbach, L. J. 1951.Coefficient alpha and the internal structure of tests.*Psychometrika*, 16,297-334

Cocker, A. L. 2005.*Relevance and Reliability: A Trade-off?* 8. Dunedin, New Zealand.

Collins, D. W. and P. Hibrar. 2000. Errors in Estimating Accruals: Implications for Empirical Research. available at tippie.uiowa.edu/accounting/mcgladrey/workingpapers/00-07.pdf; accessed on 30.06.2013.

Collins, K. 1999. Strategy and execution of ERP upgrades.*Government Finance Review*, 15(4): 43-47.

Cooper, R. B. and R. W. Zmud. 1990. Information Technology Implementation Research : A Technological Diffusion Approach, *Management science* 36(2): 123-139.

Cooper, R. and R.S. Kaplan. 1999. *The Design and Cost Management Systems*. Upper Saddle River, NJ: Prentice Hall.

Currie, W. L. and M. W. Guah. 2007. Conflicting institutional logics: a national programme for IT in the organizational field of healthcare. *Journal of Information Technology*, 22(3): 235-247.

Currie, W. 2009. Contextualizing the IT artifact: towards a wider research agenda for IS using institutional theory. *Information, technology & people,* 22(1): 63-77.

Daneva, M. 2003. Lessons learnt from five years of experience in ERP requirements engineering, in proceedings of the 11th IEEE International Requirements Engineering Conference, 45-54.

Davenport, T.H. 1998. Putting the enterprise into the enterprise system. *Harvard Business Review*, July-August: 121-131.

Davenport T, J. Harris and S. Cantrell. 2002. The return of enterprise solutions: the director's cut.http://www.accenture.com/xd/xd.asp?it=enweb&xd=_isc\iscresearchreportabstract_174.xml/[November 2004]; accessed on 12.06.2013.

DeAngelo, L. E. 1986. Accounting numbers as market valuation substitutes: A study of management buyouts of public stockholders. *The Accounting Review*, 61(3): 400-420.

Dechow, P. M., R. G. Sloan and A. P. Sweeney. 1995. Detecting earnings management. *The Accounting Review* 70 (April): 193–225.

Deloitte Consulting. 1998. *ERP'sSecond Wave- Maximizing the Value of ERP-Enabled Processes*. Deloitte Consulting: New York.

Dillard, J. F. and K. Yuthas. 2006. Enterprise resource planning systems and communicative action, *Critical Perspectives on Accounting*, 17(2-3): 202-223.

DiMaggio, P. J. and W. W. Powell. 1983. The Iron Cage Revisited: Institutional Isomorphism and Collective Rationality in Organizational Fields, *American Sociological Review*, 48(2): 147-160.

Doyle, J. T., W. Ge and S. E. McVay. 2007. Accruals quality and internal control over financial reporting. *The Accounting Review*, 82 (5): 1141–1170.

DuCharme, L.L., P.H. Malatesta and S.E. Sefcik. 2000. Earnings Management: IPO Valuation and Subsequent Performance, *Working paper*, University of Washington.

Duff, R. J. and M. Jain. 1998. CFO's guide to EDI: how can you control the new paperless environment?.*The Journal of Corporate Accounting and Finance*, 10(1): 107-27.

Entwistle, G. M. and F. Phillips. 2003. Relevance, reliability, and the earnings quality debate. *Issues in Accounting Education*, 18(1): 79—92.

Falk, M. 2005. ICT-linked firm reorganization and productivity gains. *Technovation*, 25(11): 1229-1250.

FASB (Financial Accounting Standards Board). 1976. Discussion Memorandum, *Conceptual Framework for Financial Accounting and Reporting:Elements of Financial Statements and their Measurement*. Norwalk, Connecticut, USA: FASB.

FASB (Financial Accounting Standards Board). 1978. Statement of Financial Accounting Concepts No. 1, *Objectives of Financial Reporting by Business Enterprises*. Norwalk, Connecticut, USA: FASB.

FASB (Financial Accounting Standards Board). 1980. *SFACNo. 2: Statement of Financial Accounting Concepts No. 2: Qualitative Characteristics of Accounting Information*. Norwalk, Connecticut, USA: FASB.

Finney, S. and M. Corbett. 2007. ERP implementation: A compilation and analysis of critical success factors. *Business Process Management Journal*, 13: 329-47.

Fisher, D. M. 2006. Staff Perceptions of an Enterprise Resource Planning System Implementation: A Case Study of Three Australian Universities. An unpublished thesis available at http://acquire.cqu.edu.au:8080/vital/access/manager/Repository/cqu:3241; Retrieved 10 October 2015.

Fligstein, N. 2001. Social Skill and the Theory of Fields. *Sociological Theory*, 19(2): 105-125.

Forshlund, H. and P. Jonsson. 2007. Dyadic Integration of the Performance Management Process: A Delivery case study. *International Journal of Physical Distribution and Logistics Management*, 37 (7): 546-567.

Friedland, R. and R. R. Alford. 1991. Bringing Society Back In: Symbols, Practices, and Institutional Contradictions, in W.W. Powell and P. DiMaggio (eds.), *The New Institutionalism in Organizational Analysis*, Chicago: University of Chicago Press, 232-263.

Galani, D., E. Gravas and A. Stavropoulos. 2010. The impact of ERP systems on accounting processes. *World Academy of Science, Engineering and Technology*, 66: 418-23

Gatiker, T. F. and D. L. Goodhue. 2004. Whathappensafter ERP implementation: Understanding the impact of inter-dependence and differentiation on plant-leveloutcomes. *MIS Quarterly*, 29(3) :559-585.

Genoulaz, V. B., P.-A. Millet and B. Grabot. 2005. A survey on the recent research literature on ERP systems. *Computers in Industr*y 56: 510-522.

George, H. B. and W. S. Hopwood. 2010. *Accounting Information Systems*. New Jersey: Prentice Hall; 10th ed.

George J. B., D. R. Carmichael, Demski, J. S., Dharan, B, G., Jamal and S. Gosain. 2004. Enterprise Information Systems as Objects and Carriers of Institutional Forces: The New Iron Cage, *Journal of the Association for Information Systems,* 5(4): 151-182.

Givoly, D. and D. Palmon. 1982. Timeliness of annual earnings announcements: Some empirical evidence. *The Accounting Review,* 57: 486–508.

Gosain, S. 2004. Enterprise Information Systems as Objects and Carriers of Institutional Forces: The New Iron Cage, *Journal of the Association for Information Systems,* 5(4): 151-182.

Graham, J. R., R. Campbell, b. Harveya and S. Rajgopal. 2005. The economic implications of corporate financial reporting. *Journal of Accounting and Economics,* 40: 3-73.

Granlund, M. and T.Malmi. 2002. Modern impact of ERPS on Management Accounting: a lag or permanent outcome? *Management Accounting Research,* 13: 299-321.

Greenwood, R., C. Oliver, K. Sahlin and R. Suddaby. 2008a. Introduction. In R. Greenwood, C. Oliver, K. Sahlin and R. Suddaby (eds.), *The SAGE handbook of organizational institutionalism* (London: Sage).

Greenwood, R., C. Oliver, R. Suddaby and K. Sahlin-Andersson. 2008b. *The SAGE handbook of organizational institutionalism*. London: Sage.

Greenwood, R., R. Suddaby and C. R. Hinings. 2002. Theorizing Change: The Role of Professional Associations in the Transformation of Institutionalized Fields. *Academy of Management Journal,* 45(1): 58-80.

Guffond, J. L. and G. Leconte. 2004. Les ERP, puissantsoutils d' organization du changement. *industrial Revue sciences de la societespecial issue on ERP2*. [The title of the article in English is "ERP, powerful tools for organizing change" and the meaning of the journal title is "*Industrial Science Journal of the Society*, Special Issue on ERP 2." It is to be noted that the content of the article was in English.].

Gulledge, T. 2006. What is integration?.*Industrial Management & Data Systems,* 106(1): 5-20.

Gupta, A. 2000. Enterprise Resource Planning: The emerging organizational value systems. *Industrial Management & Data Systems,* 100(3): 114-18.

Han, J. C. Y. and J. J. Wild. 1997. Timeliness of reporting and earnings information transfers. *Journal of Business Finance & Accounting,* 24: 527-540.

Hargrave, T., J. and Van De Ven, A. H. 2006.A Collective Action Model of Institutional Innovation.*Academy of Management. The Academy of Management Review,* 31(4): 864-888.

Hayes, D. C., J. E. Hunton and J. L. Reck. 2001. Market reaction to ERP implementation announcements. *Journal of Information Systems,* 15: 3-18.

Healy, P. 1985. The Effect of Bonus Schemes on Accounting Decisions.*Journal of Accounting and Economics*, 7: 85-107.

Healy, P. M. and J. Wahlen. 1999. A review of the earnings management literature and its implications for standard setting. *Accounting Horizons*, 13 (4): 365–383.

Healy, P.M., S.C. Myers, and C.D. Howe. 2002. R&D accounting and the trade-off between relevance and objectivity. *Journal of Accounting Research, 40* (3): 677-710.

Hedman, J. and A. Borell. 2004. Narratives in ERP systems evaluation. *Journal of Enterprise Information Management,* 17(4): 283-290.

Hitt, L. M., D. J. Wu and X. Zhou. 2002. Investment in enterprise resource planning: Business impact and productivity measures. *Journal of Management Information Systems,* 19 (1): 71–98.

Hogan, C. E. and M. S. Wilkins. 2005. Internal control weaknesses and earnings management. *Working Paper*, Southern Methodist University.

Holland, C.P. and B. Light. 1999. A critical success factors model for ERP implementation. *IEEE Software,* 16(3): 30-36.

Hooper, K. 1997. Statement of financial position… What's in a name? *Chartered Accountants Journal of New Zealand, 76* (3): 37-40.

Hribar, P., D. Collins, 2002. Errors in Estimating Accruals: Implications for Empirical Research, *Journal of Accounting Research* 40.

Huang, Z. and P. Palvia. 2001. ERP implementation issues in advanced and developing countries. *Business Process Management*, 7 (3): 276-84.

Huang, A., D. Yen, D. Chou and Y. Xu, 2003. Corporate applications integration: challenges, opportunities, and implementation strategies, *Journal of Business and Management*, 9(2): 137-45.

Huang, M., J. Wang, J. Yu and C. Chiu. 2004. Value added E.R.P information into information goods: An economic analysis. *Industrial Management & Data Systems*, 104(8): 689-97.

Hunton, J. E., R. A. McEwen and B. Wier. 2002. The reaction of financial analysts to enterprise resource planning (ERP) implementation plans. *Journal of Information Systems,* 16: 31-40.

Hunton, J. E., B. Lippincott and J.L. Reck. 2003. Enterprise resource planning systems: comparing firm performance of adopters and non-adopters. *International Journal of Accounting Information Systems,* 4(3): 165-184.

Hyvonen, T. 2003. Management accounting and information systems: ERP versus BoB. *European Accounting Review*, 12 (1): 155-173.

IASB (International Accounting Standards Board). 2001. *Framework for the preparation and presentation of financial statements*. International Accounting Standards Board; accessed on 12.06.13 from www.iasb.org.

IASB (International Accounting Standards Board). 2010a. *International Financial Reporting Standards®, Part A*. London: IASB; January.

IASB (International Accounting Standards Board). 2010b. *International Financial Reporting Standards®, Part B*. London: IASB; January.

IASB (International Accounting Standards Board). 2010c. *Conceptual Framework for Financial Reporting*. UK: London.

Iqbal, A., S. Espenlaub and N. Strong. 2004. Earning Management around UK Open Offers. *Working Paper Series*, Kent Business School, University of Kent.

Islam, A., R. Ali and Z. Ahmad. 2011. Is Modified Jones Model Effective in Detecting Earnings Management? Evidence from a Developing Economy.*International Journal of Economics and Finance*, 3(2): 116-125.

ICANZ (*Institute of Chartered Accountants of New Zealand).*2001. *Statement of Concepts for general purpose financial reporting*. Wellington, New Zealand: New Zealand Accounting Standards (July 2004 edition).

Janas, G. J. and J. Blanchet. 2000. Assessing quality of financial reporting. *Accounting Horizons* 14(3): 353-363.

Johnson, L.T. 2005. Relevance and reliability.*The FASB Report.* (February 28). Norwalk, Connecticut, USA: Financial Accounting Standards Board (FASB).

Jones, J. J. 1991.Earnings management during import relief investigations.*Journal of Accounting Research,* 29: 193-228.

Kaplan, R.S. and R. Cooper. 1998. *Cost & Effect: Using integrated cost systems to drive profitability and performance*. Boston, USA: Harvard Business School Press, Boston.

Kelle, P. and A. Akbulut. 2005. The role of ERP tools in supply chain information sharing, cooperation and cost optimization. *International Journal of Production Economics*, 93(94): 41-52.

Kim, Y., Z. Lee and S. Gosain. 2005. Impediments to successful ERP implementation process. *Business Process Management Journal*, 11(2): 158-170.

Klaus, H., M. Rosemann, and G. Gable. 2000. What is ERP?.*Information Systems Frontiers*, August, 141-157.

Kremers, M. and H. Van Dissel. 2000. ERP system migrations. *Communications of the ACM*, 43(4): 53-56.

Kumar, K. and J.V. Hillersberg. 2000. ERP experiences and evolution. *Communications of the ACM*, 43(4): 23-6.

Kumar, V., B. Maheshwari and U. Kumar. 2003. An investigation of critical management issues in ERP implementation: empirical evidence from Canadian organizations, *Technovation*, 23(9): 793-807.

Laux, R., S. Rajgopal and G. Vrana. 2007. The FASB's Conceptual Framework for Financial Reporting: A Critical Analysis. *Accounting Horizons*. 21(2): 229-238.

Lee, T., Y. B. Moon and H. Lee. 2006. Enterprise resource planning survey of Korean manufacturing firms. *Mechanical and Aerospace Engineering*, 3(6): 521-533.

Lengnick-Hall, C.A., M.L. Lengnick-Hall and S. Abdinnour-Helm. 2004. The role of social and intellectual capital in achieving competitive advantage through enterprise resource planning (ERP) systems. *Journal of Engineering and Technology Management*, 21 (4): 307–330.

Levitt, A. 1998.The "Numbers Game". Remarks made by US SEC Chairman Arthur Levitt on Sept. 28, 1998 at NYU Center for Law And Business, New York. Available at https://www.sec.gov/news/speech/speecharchive/1998/spch220.txt; Retrieved Oct. 10, 2015.

Liang, H., N. Saraf, H. Qing and X. Yajiong. 2007. Assimilation of Enterprise Systems: The Effect of Institutional Pressures and the Mediating Role of Top Management, *MIS Quarterly*, 31(1): 59-87.

Loinsky, S. 1995. *Enterprise-wise software solutions: Integration strategies and practices*. Massachusetts, USA: Addison Wesley Longman Inc.

Luo, W. and D. M. Strong. 2004. A framework for evaluating ERP implementation choices, *IEEE Transactions on Engineering Management*, 51(3): 322-333.

Mabert, V. M., A. Soni and M. A. Venkataramanan. 2000. Enterprise resource planning survey of U.S. manufacturing firms. *Production and Inventory Management Journal*, 41 (2): 52–88.

Mabert, V. A., A. Soni and M. A. Venkataramanan. 2003a. The impact of organization size on enterprise resource planning (ERP) implementations in the US manufacturing sector. *Omega*, 31(3): 235-246.

Mabert, V. A., A. Soni and M.A. Venkataramanan. 2003b. Enterprise Resource Planning: Managing the implementation process. *European Journal of Operational Research, 146*: 302-314

Markus, M. L., C. Tanis and P.C. Fenma. 2000. Multisite ERP implementations. *Communications of the ACM*, 43(4): 42-46.

Markus, M.L. and C. Tanis. 2000. The enterprise system experience–From adoption to success. In R. W. Zmud (Ed.), *Framing the Domains of IT Management: Projecting the future through the Past* (Cincinnati, Ohio, USA: Pinnaflex Educational Resources, Inc.): 173-207.

Mauldin, E. G. and S. B. Richtermeyer. 2004. An analysis of ERP annual report disclosures. *International Journal of Accounting Information Systems*, 5: 395-416.

Meyer, J. W. and B. Rowan. 1977. Institutionalized Organizations: Formal Structure as Myth and Ceremony. *American Journal of Sociology*, 83(2): 340-363.

Monk, E.F. and B.J. Wagner. 2009. *Concepts in Enterprise Resource Planning*. Boston, USA: Course Technology Cengage Learning; 3rd Ed.

Moon, Y.B. 2007. Enterprise Resource Planning (ERP): a review of the literature. *International Journal of Management and Enterprise Development*, 4 (3): 235-264.

Nah, F., J. Lau and J. Kuang. 2001. Critical factors for successful implementation of enterprise system. *Business Process Management Journal*, 7 (3): 285-97.

Nah, F. and S. Delgado. 2006. Critical success factors for ERP implementation and upgrade. *Journal of Computer Information Systems*, 46(5): 99-113.

Neil, J.D., S.G. Pourciau and T.F. Schaefer. 1995. Accounting method choice and IPO Valuation. *Accounting Horizons*, 9(3): 68-80.

O'Leary, D.E. 2000. *Enterprise Resource Planning Systems: Systems Life Cycle, Electronic Commerce and Risk*. Cambridge, UK: Cambridge University Press.

Olhager, J. and E. Selldin. 2003. Enterprise resource planning survey of Swedish manufacturing firms. *European Journal of Operational Research*, 146(2): 365–373.

Orlikowski, W. J. and S. R. Barley. 2001. Technology and Institutions: What can research on information technology and research on organizations learn from each other. *MIS Quarterly*, 25(2): 145-135.

Parker, R.H. 1996.*Macmillan Dictionary of Accounting*. London: Jessica Kingsley.2nd Ed.

Parr, A.N, and G. Shanks. 2000. A taxonomy of ERP implementation approaches. *IEEE Proceedings of the 33rd Hawaii International Conference on Systems Science* (Maui, Hawaii, USA). 7: 1-10.

PCAOB (Public Company Accounting Oversight Board). 2004. An Audit of Internal Control Over Financial Reporting Performed in Conjunction with an Audit of Financial Statements. *PCAOB Release No. 2004-001*. Washington, DC: PCAOB.

Pollock, N. and J. Cornford. 2004. ERP systems and the university as a "unique" organization. *Information Technology & People*, 17: 31-52.

Porter, M.E. 1979. How competitive forces shape strategy. *Harvard Business Review,* 57(4): 2-10.

Porter, M.E. 1985. *Competitive Advantage*. New York: Free Press.

Porter, M.E. 1996. What is strategy?.*Harvard Business Review,* 74(6): 61-78.

Poston, R. and S. Grabski. 2001. Financial impacts of enterprise resource planning implementations. *International Journal of Accounting Information Systems,* 2 (4): 271–294.

Poulymenakou, A.K. and S.A. Borotis. 2005. Adoption of enterprise resource planning systems in Greece. In P. Bozanis and E.N. Houstis (eds.), *LNCS 3746* (Berlin: *Springer-Verlag):*559-570.

Pounder. B. 2010. A common framework for accounting standards.*Strategic Finance* (Nov.).Available at http://findarticles.com/p/articles/mi_hb6421/is_5_92/ai_n56550179/; Accessed on 31.03.2012.

Quattrone, P. and T. Hopper. 2001. What does organizational change mean? Speculations on a taken for granted category.*Management AccountingReview*, 1: 201-233.

Rahman, M., M. Moniruzzaman and M. Sharif. 2012. Techniques, Motives and Controls of Earnings Management. *International Journal of Information Technology and Business Management,* 11(1): 22-34.

Rangan, S. 1997. Earnings Management and the performance of seasoned equity offerings, *Journal of Financial Economics,* 50: 101-122.

Rappaport, A. 1964. Materiality. *The Journal of Accountancy*, April: 45-52.

Raymond, L., S. Uwizeyemungu and F. Bergeron. 2005. ERP adoption for e-government: An analysis of motivations. *eGoverment Workshop '05 (eGOV05)*. London: Brunel University.

Riccio, E. L. 2000.Analysis of the effects of ERP systems in accounting organization.*Proceedings of 5th International Seminar on Manufacturing Accounting Research,* pp. 1-13, Brazil. Available at http://www.tecsi.fea.usp.br/disciplinas/5846/textos/ pdf/effects.erp.systems.accounting.organization.pdf; accessed on 12.06.2013.

Rodgers, P. 2007. International Accounting Standards: From UK Standards to IAS – an accelerated route to understanding the key principles. Jordan Hill, Oxford, UK: CIMA Publishing is an imprint of Elsevier; accessed on 31.03.2012.

Rogowsky, A. and T. Somers. 2000. Call for papers: JMIS special section on ERP, http://rmm-java. Stern.nyu.edu/jmis/cfpERP.html; accessed on 12.06.2013.

Romney, M. B. and P. J. Steinbart. 2003. *Accounting Information Systems*. New Jersey: Pearson Education, Inc. 9thed.

Ronen, J. and V. Yaari. 2008. *Earnings Management: Emerging Insights in Theory, Practice, and Research*. New York, USA: Springer Science+Business Media, Inc.

Roychowdhury, S. 2006. Earnings management through real activities manipulation.*Journal ofAccounting and Economics*, 42(3): 335–370.

Sarker, S. and A.S. Lee. 2003. Using a case study to test the role of three key social enablers in ERP implementation. *Information and Management*, 40(8): 813-29.

Sarkis, J. and R. P. Sundarraj. 2003. Managing large-scale global enterprise resource planning systems: A case study at Texas instruments. *International Journal of Information Management*, 23: 431-442.

Sanchez, N. G. and L. E. P-Bernal. 2007. Determination of critical success Factors in implementing an ERP system: A field study in Mexican Enterprises. *Information Technology for Development*, 13 (3): 293-309.

Scapens, R.W. and M. Jazayeri. 2003. ERP systems and management accounting change: opportunities or impacts? A research note.*European Accounting Review*, 12 (1): 201-233.

Schipper, K. 1998. Commentary on Earnings Management.*Accounting Horizon*, 3: 91-102.

Scott, W. R. 2001.*Institutions and Organizations*. Thousand Oaks, Los Angeles, California, USA: Sage; Second ed.

Scott, W. R. 2004. Institutional Theory: Contributing to a Theoretical Research Program. In K.G. Smith and E. Michael A. Hitt (eds.), *Great minds in management: The process of theory development* (Oxford: Oxford University Press): 460-484.

Scott, W. R. 2008.*Institutions and Organizations: Ideasand Interests*. Thousand Oaks, Los Angeles, California, USA: Sage; Third ed.

Scott, W. R. and J. W. Meyer. 1991. The organization of societal sectors: propositions and early evidence. In W.W. Powell and P. DiMaggio (eds.), *The New Institutionalism in Organizational Analysis* (Chicago, USA: University of Chicago Press): 108-140.

Seddon PB. 2005. Are ERP systems a source of competitive advantage?.*Strategic Change,* 14: 283-293.

Sehgal, S., S. Subramaniam, and L.P. Morandiere. 2012. A search for rational sources of stock return anomalies: evidence from India. *International Journal of Economics and Finance*, 4(4): 121-134.

Shafakheibari, N. and B. Oladi. 2015. The effect of ERP system on Relevance of Accounting Data and Quality of Financial Reporting. *Management and Administrative Science Review*, 4(3): 504-514.

Sia, S. K. and C. Soh. 2007. An assessment of package-organization misalignment: institutional and ontological structures. *European Journal of Information Systems*,16(5): 568-583.

Smith, M. J. De. 2015. *Statistical Analysis Handbook*. Winchelsea, UK: The Winchelsea Press.

Soh, C. and S. K. Sia. 2004. An institutional perspective on sources of ERP package-organization misalignments. *The Journal of Strategic Information Systems*, 13(4): 375-397.

Soja, P. 2008. Difficulties in enterprise system implementation in emerging economies: Insights from an exploratory study in Poland. *Information Technology for Development*, 14(1): 31-51.

Somers, T. M. and K. G. Nelson. 2004. A taxonomy of players and activities across the ERP project life cycle. *Information and Management,* 41 (3): 257-278.

Somers, T.M. and K. G. Nelson. 2001. The impact of strategy and integration mechanisms on enterprise system value: empirical evidence from manufacturing firms. *European Journal of Operational Research,* 146(2): 315-338.

Spathis, C. and S. Constantinides. 2004. Enterprise resource planning systems' impact on accounting processes. *Business Process Management Journal*, 10 (2): 234-247.

Stratman. J. K. and A. V. Roth. 2002. Enterprise resource planning (ERP) competence constructs: Two stage multi-item scale development and validation. *Decision Sciences* 33: 601-628.

Supramaniam, M. and M. Kuppusamy. 2010. ERP system implementation: A Malaysian perspective. *Journal of Information Technology Management*.XXI (1): 35-48.

Svejvig, P. 2013. Using institutional theory in enterprise systems research: Developing a conceptual model from a literature review. *International Journal of Enterprise Information Systems*, 9(1): 1-30.

Swanson, E. B. and N. C. Ramiler. 1997. The organizing vision in information systems innovation. *Organization Science*, 8: 458-474.

Teoh, S.H., I. Welch and T.J. Wong. 1998a. Earnings Management and the Under Performance of Seasoned Equity Offerings.*The Journal of Financial Economics*, 50: 63-99.

Teoh, S.H., I. Welch and T.J. Wong. 1998b. Earnings Management and the Long Run Market Performance of Initial Public Offerings, *The Journal of Financial LIII* (6).

Themistocleous, M., Z. Irani, and R.M. O'Keefe. 2001. ERP and application integration. Exploratory survey. *Business Process Management Journal*, 7 (3): 195-204.

Thornton, P. H. and W. Ocasio. 2008. Institutional Logics. In R. Greenwood, C. Oliver, R. Suddaby and K. Sahlin-Andersson (eds.), *The Sage Handbook of Organizational Institutionalism* (Thousand Oaks, California, USA: Sage Publications): 99-129.

Tijani, O. M. and M. G. Ogundeji. 2014. Enterprise Resource Planning Systems Implementation: Effects on Accounting Information Processing. *Advances in Economics and Business*, 2(2).

Tolbert, P. S. and L. G. Zucker, 1999. The institutionalization of institutional theory. In S. Clegg and C. Hardy (eds.), *Studying Organization: Theory & Method; Handbook of Organization Studies, Vol. 1* (London: Sage): 169-184.

Turban, E., E. Mclean and J. Wetherbe. 2003. *Information technology for management*. Hoboken, New Jersey, USA: John Wiley & Sons, Inc..

Umble, E.J., R.R. Half, and M.M. Umble. 2003. Enterprise resource planning: Implementation procedures and critical success factors. *European Journal of Operational Research*, 146: 241-257.

Varian HR. 2004. How much does information technology matter?.*New York Times*, 6 May.

Verville, J. and A. Halingten. 2003. A six-stage model of the buying process for ERP software. *Industrial Marketing Management,* 32(7): 585-594.

Velcu O. 2007. Exploring the effects of ERP systems on organizational performance. Evidence from Finish companies.*Industrial Management & data systems*, 107 (9): 1316-1334.

Verville, J. and A. Halingten. 2003. A six-stage model of the buying process for ERP software. *IndustrialMarketingManagement*, 32 (7): 585-594.

Wah, L. 2000. Give ERP a chance. *Management Review* (May): 20–24.

Waxer, C. 2006.Your business in a tiny box.*Fortune Small Business*, 16(10).

Wei, C-C., C-F. Chien and M-J. J. Wang. 2005. An AHP-based approach to ERP system selection. *International Journal of Production Economics*, 96 (1): 47–62.

Wier, B., J. Hunton, and H. R. HassabElnaby. 2005. Enterprise resource planning and non-financial performance incentives: The joint impact on corporate performance. *Working Paper*, Richmond, Virginia, USA: Virginia Commonwealth University.

Wilson, J. Q., and G. L. Kelling. 1982. Broken windows: The police and neighborhood safety. *Atlantic Monthly*, 249 (3): 29–38.

Winters, B. I. 2004. Choose the right tools for internal control reporting. *Journal of Accountancy*,197 (February): 34-40.

Wright, S. and A. M. Wright. 2002. Information system assurance for Enterprise Resource Planning systems: Unique risk considerations. *Journal of Information Systems*, 16 Supplement, 99-113.

Wu, J.-H. and Y-M. Wang. 2003. Enterprise resource planning experience in Taiwan: an empirical study and comparative analysis. Paper presented in the *36th Annual Hawaii International Conference on System Sciences (HICSS' 03)*, Big Island, Hawaii, January 6-9.

Wu, J-H. andY-M. Wang. 2006. Measuring ERP success: the ultimate users' view. *International Journal of Operations & Production Management*, 26(8): 882–903.

Wu, J-H., and Y-M. Wang. 2007. Measuring ERP success: The key-users' viewpoint of the ERP to produce a viable IS in the organization. *Computers in Human Behavior*, 23(3): 1582–1596.

Xenakis, J.J. 1999. A mile wide and a mile deep.*CFO Magazine*, February: 57-68.

Yang S, and P.B. Seddon 2004. Benefits and key project success factors from enterprise systems implementations: lessons from Sapphire 2003. Proceedings of the 15th Australasian Conference on Information Systems, Hobart, Australia.

Yen, H. R. and C. Sheu. 2004. Aligning ERP implementation with competitive priorities of manufacturing firms: an exploratory study, *International Journal of Production Economics*, 92(3): 207-220.

Yoon, S. and G. Miller.2002b. Cash from Operations and Earnings Management in Korea, *International Journal of Accounting*, 37: 395-412.

Yoon, S., G. Miller and P. Jiraporn. 2006. Cash from Operations and Earnings Management in Korea, *Journal of International Financial Management and Accounting,* 85-109.

Yu, Yong. 2005. Do investors overreact or underreact to accruals? A reexamination of the accrual anomaly. Available at http://www.kellogg.northwestern.edu/accounting/ papers/Yong%20Yu.pdf; accessed on 30.06.2013.

Zhang, L., M. Lee, and P. Banerjee. 2002. Critical success factors of enterprise resource planning systems implementation success in China. *IEEE Proceedings of the 36th Hawaii International Conference on System Sciences*, 1-10.

Zhang, L., M.K.O. Lee, Z. Zhang and P. Banerjee. 2003. Critical success factors of enterprise resource planning systems implementation success in China. Paper presented in the *36th Annual Hawaii International Conference on System Sciences (HICSS' 03)*, Big Island, Hawaii, USA: Jan. 6-9.

Zhang, Y. 2011. Accounting and Neoliberalism: A critical reading of IASB/FASB's *Conceptual Framework for Financial Reporting 2010*. Submitted to the CPA 2011 conference. Available at: *http://elsevier.conference-services.net/resouces/247/2182/pdf/ CPAC2011_0037_paper.pdf;* accessed on 30.06.2013.

Zucker, L. G. 1977.The role of institutionalization in cultural persistence.*American Sociological Review, 42*(5): 726-744.

Websites (the websites were accessed in July 2011):

www.dsebd.org

www.sec.gov.bd

www.accountingcoach.com/terms/A/activity-based-costing

www.merriam webster.com/dictionary/internal%20control

www.dictionary.com/browse/y2k-bug

ANNEXES

Annexe-1

List of Questions for Stakeholder Interview

List of Questions on

"The Effects of Implementing Enterprise Resource Planning Systems on Accounting Information: Bangladesh Perspective"

Please provide your comments in the boxes below and tick marks where applicable:

Section-I:

1. Name and address of the respondent (optional)

…….

…….

…….

2. Name of the firm attached
3. Age: a) 30-40 years b) 40-50 years c) 50 years and more
4. Academic qualification : a) Graduation b) Post graduation c) Others
5. Professional experience:

a) 0-5 years b) 6-10 years c) 11-15 years d) Greater than 15 years

6. ERP experience: a) Yes b) No
7. Professional intimation: a) ACA b) FCA

Section-II:

Fundamental Qualitative Characteristics:

1. How ERP implementation has affected faithful representation of accounting information? Give opinion.
2. How ERP implementation has affected neutrality of accounting information? Give opinion.
3. How ERP implementation has affected predictive value of accounting information? Give opinion.
4. How ERP implementation has affected feedback value of accounting information? Give opinion.

Enhancing Qualitative Characteristics:

1. How ERP implementation has affected timeliness of accounting information? Give opinion.
2. How ERP implementation has affected verifiability of accounting information? Give opinion.

Annexe-2

Questionnaire on ERP

Department of Accounting & Information Systems
Faculty of Business Studies
University of Dhaka, Dhaka-1000, Bangladesh

Phone :9661900-59/7891
9670670
Fax :880-2-8615583
E-mail :duregstr@udhaka.net

Date: 14.08.2011

To Whom It May Concern

This is to inform that **Mr. James Bakul Sarkar**, Assistant Professor, School of Business, United International University , Dhaka has been undertaking a research study titled "The effects of Implementing Enterprise Resource planning systems of Accounting Information: Bangladesh perspective" to pursue his Ph. D at Dhaka university under my supervision. For this purpose he has to conduct survey on the ERP- adopting and non- adopting corporate entities (enlisted with DSE and / or CSE) in context of Bangladesh This is exclusively for collection information/views of the external auditors (professional accountants) of the respective companies, which I consider extremely important to carry out his research. I can fully assure you that the identity of the respondents as well as the answers to the question shall be kept strictly confidential and used for academic purposes.

I do, therefore, hope and solicit that the respondents will extend their heartiest cooperation and thoughtful consideration of the questionnaire and help the researcher through providing responses to those queries.

With thanks and regards

14/8/2011

Prof. Dr. Swapan Kumar Bala FCMA
Department of Accounting and Information Systems
University of Dhaka
Dhaka

Dr. Swapan Kumar Bala FCMA
Professor
Department of Accounting
& Information Systems
Dhaka University

Cover-Letter and Questionnaire for the professional accountants with respect to effects of ERP implementation on accounting information in Bangladesh

To:

Researcher:
James Bakul Sarkar
Assistant Professor of Accounting
School of Business
United International University
House # 80, Road # 8/A (Old-15)
Satmasjid Road, Dhanmondi,
Dhaka-1209, Bangladesh
E-mail: jmssarkar@yahoo.com

Dear Sir/Madam:

My very best personal regards.
Trusting you will be really happy to learn that I have undertaken a research study titled – "The Effects of Implementing Enterprise Resource Planning Systems on Accounting Information: Bangladesh Perspective" to pursue my Ph. D at Dhaka University under the supervision of Dr. Swapan Kumar Bala. To do this study, I consider your expert opinions/views most important. The success of this research is significantly dependent upon the frankness and care with which you answer the questions. Hence, I solicit your thoughtful consideration of all the questions. Kindly be sure that the administration of the enclosed questionnaire is not meant for a test of any sort. This is exclusively for the purpose of surveying your expert views/judgments, which I consider extremely important to carry out my research.

I would therefore, feel extremely grateful to you, should you kindly help me in my research endeavor by completing the questionnaire promptly. I can fully assure you that your identity as well as the answers to the question shall be kept strictly confidential. No one except me will ever see the questionnaire you filled in. You need not put your signature anywhere.

Thanks a lot for your kind participation in my research study.

Most sincerely yours,

(James Bakul Sarkar)

Questionnaire on

"The Effects of Implementing Enterprise Resource Planning Systems on Accounting Information: Bangladesh Perspective"

Please provide your comments in the boxes below and tick marks where applicable:

Section-I:

1. Name and address of the respondent (optional)
   ……
   ……
   ……

2. Name of the firm attached

3. Age: a) 30-40 years b) 40-50 years c) 50 years and more

4. Academic qualification : a) Graduation b) Post graduation c) Others

5. Professional experience:

   a) 0-5 years b) 6-10 years c) 11-15 years d) Greater than 15 years

6. ERP experience: a) Yes b) No

7. Professional intimation: a) ACA b) FCA

8. Rank the following usefulness of ERP implementation in ascending order:

   a) Credit management ☐
   b) Consistent recordkeeping ☐
   c) Accurate inventory costing systems
   d) Activity-Based Costing (ABC) in addition to traditional costing system ☐
   e) Smooth closure of books (closing entries) ☐
   f) Automatic currency translation in case of companies with subsidiaries ☐
   g) Smooth recording of inter company transactions in case of companies with subsidiaries ☐
   h) Financial transparency that facilitates audit ☐

Please indicate to what extent you agree or disagree with the following statements. Please encircle the numbers (codes) that best suit your answer/response:

Section-II:

Part-A: Faithful Representation

Items	Opinion				
	Strongly Disagree	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
I. ERP adoption increases managerial access to information	**1**	**2**	**3**	**4**	**5**
II. ERP adoption increases the extent of managerial discretion	**1**	**2**	**3**	**4**	**5**
III. ERP adoption facilitates the CEO and the CFO to certify that their company's financial statements and accompanying disclosures fairly represent the results of operations.	**1**	**2**	**3**	**4**	**5**
IV. ERP adoption facilitates the preparation of internal control report by management, management assertion as to the effectiveness of the firm's internal control structure in the report and finally audit firm's opinion regarding the management assertion.	**1**	**2**	**3**	**4**	**5**
V. ERP adoption facilitates the disclosure of firm's compliance with Company's Act 1994, International Financial Reporting standards, SEC guidelines and other relevant applicable laws.	**1**	**2**	**3**	**4**	**5**
VI. ERP decreases adequate separation of duties.	**1**	**2**	**3**	**4**	**5**
VII. ERP decreases proper authorization of transactions and activities.	**1**	**2**	**3**	**4**	**5**
VIII. ERP decreases adequate documents and records	**1**	**2**	**3**	**4**	**5**
IX. ERP decreases physical control over assets and records.	**1**	**2**	**3**	**4**	**5**
X. ERP decreases independent checks on performance.	**1**	**2**	**3**	**4**	**5**
XI. ERP decreases the effectiveness of	**1**	**2**	**3**	**4**	**5**

audit mechanisms					
XII. ERP decreases the effectiveness of internal control mechanisms	**1**	**2**	**3**	**4**	**5**

Part-B: Neutrality

I. ERP increases the possibility that reported facts may influence the investor's opinion or behavior.	**1**	**2**	**3**	**4**	**5**

Section-III:

Part –A: Feedback value

Items	**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
I. ERP provides information that is adequate in assessing whether reported results confirm previous expectations of users.	**1**	**2**	**3**	**4**	**5**
II. ERP provides feedback to users as to how various market events and significant transactions affected the company.	**1**	**2**	**3**	**4**	**5**

Part-B: Predictive value

I. ERP provides information that is useful in assessing the likely levels of recurring earnings, i.e., the company's sustainable earnings potential	**1**	**2**	**3**	**4**	**5**
II. ERP permits users to identify and assess the differing opportunities and risks contained within the company's various businesses.	**1**	**2**	**3**	**4**	**5**

Section-IV:

Part –A: Timeliness

I. ERP increases timeliness for complying with SEC filing requirements/ publication of annual and interim reports	**1**	**2**	**3**	**4**	**5**
II. ERP adoption enables the company management to publish its financial statements earlier as compared with its competitor.	**1**	**2**	**3**	**4**	**5**
III. ERP enables the management to find new ways of communicating financial information.	**1**	**2**	**3**	**4**	**5**
IV. ERP adoption increases timeliness of reporting.	**1**	**2**	**3**	**4**	**5**

Part-B: Verifiability

I. ERP adoption decreases the extent of consensus of accounting measures among different observers	**1**	**2**	**3**	**4**	**5**
II. ERP adoption decreases the assurance of correspondence of accounting information to economic events					
III. ERP adoption decreases the number of direct verification in different items					
IV. ERP adoption increases the number of indirect verification (allocation) in different items					

"Thank you for your kind cooperation"

Annexe-3

Modified Jones and Extended Modified Jones Model

Modified Jones Model[G]

Analysis of earnings management often focuses on management's use of discretionary accruals. Such research requires a model that estimates the discretionary component(s) of reported income. Existing models range from simple models in which discretionary accruals are measured as total accruals, to more sophisticated models that attempt to separate total accruals into discretionary and nondiscretionary components. There is, however, no systematic evidence bearing on the relative performance of these alternative models at detecting earnings management.

The relative performance of the competing models by comparing the specification and power of commonly used test statistics are evaluated. The specification of the test statistics is evaluated by examining the frequency with which they generate type I errors. Type I errors arise when the null hypothesis is that earnings are not systematically managed in response to the stimulus identified by the researcher is rejected when the null is true. Type I errors for both a random sample of firm-years and for samples of firm-years are generated with extreme financial performance. Samples with extreme financial performance are focused because the stimuli investigated in previous research are frequently correlated with financial performance Thus, the findings shed light on the specification of test statistics in cases where the stimulus identified by the researcher does not cause earnings to be managed, but is correlated with firm performance.

The power of the test statistics is evaluated by examining the frequency with which they generate type II errors. Type II errors arise when the null hypothesis that earnings are not systematically managed in response to the stimulus identified by the researcher is not rejected when it is false. Type II errors are generated in two ways. First, rejection frequencies are measured for samples of firm-years in which we have artificially added a fixed and known amount of accruals to each firm-year. These simulations are similar to those performed by Brown and Warner (1980, 1985) in evaluating alternative models for detecting abnormal stock price performance. However, our simulations differ in several respects. In particular, explicit assumptions are made concerning the components of accruals that are managed and the timing of the accrual reversals. To the extent that our assumptions are not representative

of the circumstances of actual earnings management, our results lack external validity. To circumvent this problem, type II errors are generated for a second set of firms, for which we have strong priors that earnings have been managed (Schipper, 1989). This sample consists of firms that have been targeted by the Securities and Exchange Commission (SEC) for allegedly overstating annual earnings. The external validity of these results rests on the assumption that the SEC has correctly identified firm-years in which earnings have been managed. This assumption seems reasonable, since the SEC (1992) indicates that out of the large number of cases that are brought to its attention, it only pursues cases involving the most significant and blatant incidences of earnings manipulation.

The empirical analysis generates the following major insights. First, all of the models appear well specified when applied to a random sample of firm-years. Second, the models all generate tests of low power for earnings management of economically plausible magnitudes (e.g., one to five percent of total assets). Third, all models reject the null hypothesis of no earnings management at rates exceeding the specified test-levels when applied to samples of firms with extreme financial performance. Finally, a version of the model developed by Jones (1991) that is modified to detect revenue-based earnings management generates the fewest type II errors.

Measuring Discretionary Accruals

The usual starting point for the measurement of discretionary accruals is total accruals. A particular model is then assumed for the process generating the nondiscretionary component of total accruals, enabling total accruals to be decomposed into a discretionary and a nondiscretionary component. Most of the models require at least one parameter to be estimated, and this is typically implemented through the use of an "estimation period," during which no systematic earnings management is predicted. This paper considers five models of the process generating nondiscretionary accruals. These models are general representations of those that have been used in the extant earnings management literature. All the models have been casted in the same general framework to facilitate comparability, rather than trying to exactly replicate the models as they may have appeared in the literature.

The Healy Model

Healy (1985) tests for earnings management by comparing mean total accruals (scaled by lagged total assets) across the earnings management partitioning variable. Healy's study differs from most other earnings management studies in that he predicts that systematic earnings management occurs in every period. His partitioning variable divides the sample into three groups, with earnings predicted to be managed upwards in one of the groups and downward in the other two groups. Inferences are then made through pairwise comparisons of the mean total accruals in the group where earnings is predicted to be managed upwards to the mean total accruals for each of the groups where earnings is predicted to be managed downwards. This approach is equivalent to treating the set of observations for which earnings are predicted to be managed upwards as the estimation period and the set of observations for which earnings are predicted to be managed downwards as the event period. The mean total accruals from the estimation period then represent the measure of nondiscretionary accruals. This implies the following model for nondiscretionary accruals:

$$NDA_{2} = \frac{\sum_{t} TA_{t}}{T} \qquad (1)$$

where

NDA = estimated nondiscretionary accruals;

TA = total accruals scaled by lagged total assets;

t = 1, 2,...T is a year subscript for years included in the estimation period; and

2 = a year subscript indicating a year in the event period.

The DeAngelo Model

DeAngelo (1986) tests for earnings management by computing first differences in total accruals, and by assuming that the first differences have an expected value of zero under the null hypothesis of no earnings management. This model uses last period's total accruals

(scaled by lagged total assets) as the measure of nondiscretionary accruals. Thus, the DeAngelo Model for nondiscretionary accruals is:

$$NDA_{it} = TA_{it-1} \qquad (2)$$

The DeAngelo Model can be viewed as a special case of the Healy Model, in which the estimation period for nondiscretionary accruals is restricted to the previous year's observation.

A common feature of the Healy and DeAngelo Models is that they both use total accruals from the estimation period to proxy for expected nondiscretionary accruals. If nondiscretionary accruals are constant over time and discretionary accruals have a mean of zero in the estimation period, then both the Healy and DeAngelo Models will measure nondiscretionary accruals without error. If, however, nondiscretionary accruals change from period to period, then both models will tend to measure nondiscretionary accruals with error. Which of the two models is more appropriate then depends on the nature of the time-series process generating nondiscretionary accruals. If nondiscretionary accruals follow a white noise process around a constant mean, then the Healy model is appropriate. If nondiscretionary accruals follow a random walk, then the DeAngelo model is appropriate. Empirical evidence suggests that total accruals are stationary in the levels and approximate a white noise process (e.g., Dechow 1994).

The assumption that nondiscretionary accruals are constant is unlikely to be empirically descriptive. Kaplan (1985) points out that the nature of the accrual accounting process dictates that the level of nondiscretionary accruals should change in response to changes in economic circumstances. Failure to model the impact of economic circumstances on nondiscretionary accruals will cause inflated standard errors due to the omission of relevant (uncorrelated) variables (problem 3). In addition, if the firms examined are systematically experiencing abnormal economic circumstances, then failure to model the impact of economic circumstances on nondiscretionary accruals will result in biased estimates of the coefficient on PART (problem 1).

The Jones Model

Jones (199 1) proposes a model that relaxes the assumption that nondiscretionary accruals are constant. Her model attempts to control for the effect of changes in a firm's economic circumstances on nondiscretionary accruals. The Jones Model for nondiscretionary accruals in the event year is:

$$NDA_{\cdot} = \sim_1 (I / A_{\cdot -1}) + \sim_2 (\Delta REV_{\cdot}) + \sim_3 (PPE_{\cdot})$$

where

ΔREV^{2} = revenues in year t less revenues in year t-1 scaled by total assets at $^{2} -1$;

PPE^{2} = gross property plant and equipment in year t scaled by total assets at $^{2} -1$;

$A_{\cdot -1}$ = total assets at t-1 ; and

$\sim_1, \sim_2, \sim_3$ = firm-specific parameters.

Estimates of the firm-specific parameters, at, a2 and a3 are generated using the following model in the estimation period:

$$TA_{\cdot} = a_1 (I / A_{\cdot -1}) + a_2 (\Delta REV_t) + a_3 (PPE_t) + \neg_t \qquad (3)$$

where

a_1 a_2 and a_3 denote the OLS estimates of $\sim_1, \sim_2$ and $\sim_3$ and TA is total accruals scaled by lagged total assets. The results in Jones (1991) indicate that the model is successful at explaining around one quarter of the variation in total accruals.

An assumption implicit in the Jones model is that revenues are nondiscretionary . If earnings are managed through discretionary revenues, then the Jones Model will remove part of the managed earnings from the discretionary accrual proxy (problem 2). For example, consider a situation where management uses its discretion to accrue revenues at year-end when the cash has not yet been received and it is highly questionable whether the revenues have been

earned. The result of this managerial discretion will be an increase in revenues and total accruals (through an increase in receivables). The Jones model orthogonalizes total accruals with respect to revenues and will therefore extract this discretionary component of accruals, causing the estimate of earnings management to be biased toward zero. Jones recognizes this limitation of her model (see Jones 1991, footnote 31).

The Modified Jones Model

A modified version of the Jones Model is considered in the empirical analysis. The modification is designed to eliminate the conjectured tendency of the Jones Model to measure discretionary accruals with error when discretion is exercised over revenues. In the modified model, nondiscretionary accruals are estimated during the event period (i.e., during periods in which earnings management is hypothesized) as:

$$NDA_{\cdot} = \sim_1 (I / A_{\cdot -1}) + \sim_2 (\Delta REV_{\cdot} - \Delta REC_{\cdot}) + \sim_3 (PPE_{\cdot}) \qquad (4)$$

where

ΔREC = net receivables in year i less net receivables in year $\cdot -1$ scaled by total assets at $\cdot -1$. The estimates of $\sim_1, \sim_2, \sim_3$ and nondiscretionary accruals during the estimation period (in which no systematic earnings management is hypothesized) are those obtained from the original Jones Model. The only adjustment relative to the original Jones Model is that the change in revenues is adjusted for the change in receivables in the event period. The original Jones Model implicitly assumes that discretion is not exercised over revenue in either the estimation period or the event period. The modified version of the Jones Model implicitly assumes that all changes in credit sales in the event period result from earnings management. This is based on the reasoning that it is easier to manage earnings by exercising discretion over the recognition of revenue on credit sales than it is to manage earnings by exercising discretion over the recognition of revenue on cash sales. If this modification is successful, then the estimate of earnings management should no longer be biased toward zero in samples where earnings management has taken place through the management of revenues.

The Extended Modified Jones Model**

The modified Jones model is extended by incorporating few additional variables such as depreciation expense, bad debt expense, retirement benefit expense and current period expense. Such extended modified Jones model proves effective in the developing particularly Asian countries like Korea and Bangladesh. (Yoon et al., 2006; Islam et al., 2011). The extended modified Jones model is as follows:

$$TAi/REVi=\beta 0+ \beta 1(\Delta REVi- \Delta RECi)/ REVi + \beta 2 (\Delta EXPi - \Delta PAYi) / REVi + \beta 3(DEPi + RETi) / REVi + \varepsilon i$$

Where

TA (Total accruals) = accounting earnings – CFO

REV = net sales revenue

REC = receivables

EXP = sum of cost of goods sold and selling and general administrative expenses excluding non-cash expenses.

PAY = payables

DEP = depreciation expenses

RET = retirement benefits expenses

Δ = change operator.

The Industry Model

The final model considered is the Industry Model used by Dechow and Sloan (1991). Similar to the Jones Model, the Industry Model relaxes the assumption that nondiscretionary accruals are constant over time. However, instead of attempting to directly model the determinants of nondiscretionary accruals, the Industry Model assumes that variation in the determinants of nondiscretionary accruals are common across firms in the same industry. The Industry Model for nondiscretionary accruals is:

$$NDA_{it} = ¥_1 + ¥_2 median(TA_{it}) \quad (5)$$

where

$median(TA_t)$ = the median value of total accruals scaled by lagged assets for all non-sample firms in the same 2-digit SIC code.

The firm specific parameters $¥_1$ and $¥_2$ are estimated using OLS on the observations in the estimation period.

The ability of the Industry Model to mitigate measurement error in discretionary accruals hinges critically on two factors. First, the Industry Model only removes variation in nondiscretionary accruals that is common across firms in the same industry. If changes in nondiscretionary accruals largely reflect responses to changes in firm-specific circumstances, then the Industry Model will not extract all nondiscretionary accruals from the discretionary accrual proxy. Second, the Industry Model removes variation in discretionary accruals that is correlated across firms in the same industry, potentially causing problem 2. The severity of this problem depends on the extent to which the earnings management stimulus is correlated across firms in the same industry.

[*] Adapted from Dechow et al. (1995).

[**] Adapted from Yoon et al. (2006) and Islam et al. (2011).

Annexe-4

Regression for predictive value

Variables Entered/Removed(b)

ERP Usage	Model	Variables Entered	Variables Removed	Method
Use	1	Year(a)	.	Enter
Non-use	1	Year(a)	.	Enter

a All requested variables entered.
b Dependent Variable: ROA

Model Summary(b)

ERP Usage	Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
Use	1	.341(a)	.116	.105	.07408
Non-use	1	.095(a)	.009	-.006	.16105

a Predictors: (Constant), Year
b Dependent Variable: ROA

ANOVA(b)

ERP Usage	Model		Sum of Squares	df	Mean Square	F	Sig.
Use	1	Regression	.060	1	.060	10.892	.001(a)
		Residual	.455	83	.005		
		Total	.515	84			
Non-use	1	Regression	.016	1	.016	.604	.440(a)
		Residual	1.712	66	.026		
		Total	1.727	67			

a Predictors: (Constant), Year
b Dependent Variable: ROA

Coefficients(a)

ERP Usage	Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
			B	Std. Error	Beta		
Use	1	(Constant)	-12.689	3.865		-3.283	.002
		Year	.006	.002	.341	3.300	.001
Non-use	1	(Constant)	-6.665	8.715		-.765	.447
		Year	.003	.004	.095	.777	.440

a Dependent Variable: ROA

Casewise Diagnostics(a)

ERP Usage	Case Number	Std. Residual	ROA
Use	45	4.428	.42
Non-use	133	6.670	1.20

a Dependent Variable: ROA

Residuals Statistics(a)

ERP Usage		Minimum	Maximum	Mean	Std. Deviation	N
Use	Predicted Value	.0219	.1110	.0680	.02668	85
	Residual	-.15196	.32798	.00000	.07363	85
	Std. Predicted Value	-1.726	1.614	.000	1.000	85
	Std. Residual	-2.051	4.428	.000	.994	85
Non-use	Predicted Value	.0831	.1304	.1091	.01529	68
	Residual	-.13684	1.07424	.00000	.15984	68
	Std. Predicted Value	-1.699	1.394	.000	1.000	68
	Std. Residual	-.850	6.670	.000	.993	68

a Dependent Variable: ROA

Annexe-5
One-Sample Statistics

Table 6.40: One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
ERP adoption increases managerial access to information	31	3.3226	1.10716	.19885
ERP adoption increases the extent of managerial discretion	31	3.3226	1.10716	.19885
ERP adoption facilitates the CEO and the CFO to certify that their company\s financial statements and accompanying disclosures fairly represent the results of operation	31	3.6774	1.01282	.18191
ERP adoption facilitates the preparation of internal control report by management, management assertion as to the effectiveness of the firm's internal control structure in the report	31	3.7097	.97275	.17471
ERP adoption facilitates the disclosure of firm's compliance with Company\s Act 1994, IFRS, SEC guidelines and other relevant applicable laws	31	3.7419	.92979	.16700
ERP decreases adequate separation of duties	31	2.6129	.91933	.16512
ERP decreases proper authorization of transactions and activities	31	2.3871	.80322	.14426
ERP decreases adequate documents and records	31	2.2581	.77321	.13887
ERP decreases physical control over assets and records	31	2.1935	.70329	.12632
ERP decreases independent checks on performance	31	2.1935	.70329	.12632
ERP decreases the effectiveness of audit mechanisms	31	2.1290	.67042	.12041
ERP decreases the effectiveness of internal control mechanisms	31	1.8387	.37388	.06715
ERP increases the possibility that reported facts may influence the investor\s opinion or behavior	31	1.8710	.34078	.06121
ERP adoption decreases the extent of consensus of accounting measures among different observers	31	2.0645	.67997	.12213
ERP adoption decreases the assurance of correspondence of accounting information to economic events	31	2.0645	.67997	.12213
ERP adoption decreases the number of direct verification in different items	31	2.1613	.73470	.13196
ERP adoption increases the number of indirect verification to different items	31	2.1613	.73470	.13196

ERP provides information that is adequate in assessing whether reported results confirm previous expectations of users	31	4.3226	.74776	.13430
ERP provides feedback to users as to how various market events and significant transactions affected the company	31	4.3226	.74776	.13430
ERP provides information that is useful in assessing the likely levels of recurringearnins., the company\s sustainable earnings potential	31	4.3871	.55842	.10029
ERP permits users to identify and assess the differing opportunities and risks contained within the company\s various businesses	31	4.3226	.54081	.09713
ERP increases timeliness for complying with SEC filing requirements/ publication of annual and interim reports	31	4.6129	.49514	.08893
ERP adoption enables the company management to publish its financial statements earlier as compared with its competitor	31	4.6129	.49514	.08893
ERP enables the management to find new ways of communicating financial information	31	4.6129	.49514	.08893
ERP adoption increases timeliness of reporting	31	4.5806	.50161	.09009
f_rep	31	2.7823	.46182	.08295
neu	31	1.8710	.34078	.06121
ver	31	2.1129	.67958	.12206
rel_fv	31	4.3226	.74776	.13430
rel_pv	31	4.3548	.53531	.09614
time	31	4.6048	.49064	.08812
arelevance	31	4.4274	.37065	.06657

Source: Survey Results

Note: f_rep – faithful representation, nue- neutrality, ver- verifiability, rel_fv- feedback value, rel_pv – predictive value, arelevance – aggregate value of relevance

Annexe-6

Data for Extended Modified Jones Model

Data for Extended Modified Jones Model:

Company Name	Year	Total accruals/ Net Revenue	(Revenue change- Receivable change)/Net Revenue	(Revenue change- Expense change)/Net Revenue	Depreciation /Net Revenue
ACI Ltd.	1996	0.000000000000	0	0	0.026334
ACI Ltd.	1997	-0.000000000003	0.256091	0	0.021545
ACI Ltd.	1998	-0.000000000027	0.150042	0.00698716	0.021445
ACI Ltd.	1999	-0.000000000009	0.182056	0.51550848	0.018679
ACI Ltd.	2000	-0.000000000079	0.140171	-0.1375801	0.017044
ACI Ltd.	2001	-0.000000000034	0.137795	0.06569455	0.01538
ACI Ltd.	2002	0.000000000034	0.176071	0.06804436	0.013533
ACI Ltd.	2003	-0.000000000043	0.049557	0.1346951	0.014519
ACI Ltd.	2004	-0.000000000030	0.113721	0.23117976	0.02001
ACI Ltd.	2005	0.000000000011	0.134327	0.27338683	0.022032
ACI Ltd.	2006	0.000000000003	0.091977	-0.1547047	0.020566
ACI Ltd.	2007	0.000000000000	0.171753	0.1641449	0.017645
ACI Ltd.	2008	0.000000000000	0.284699	0.17621825	0.013413
ACI Ltd.	2009	0.000000000008	0.012217	0.13830339	0.016825
ACI Ltd.	2010	0.000000000000	0.087984	0.74563341	0.015303
ACI Ltd.	2011	-0.000000000002	0.056421	0.37051683	0.018437
Square Pharma	95-1996	0.000000000000	0	1.87150297	0.008726
Square Pharma	96-1997	0.000000000057	-16.3777	0	0.174938
Square Pharma	97-1998	0.000000000040	0.942289	8.28004596	0.00831
Square Pharma	98-1999	0.000000000030	0.122872	-7.02666	0.00671

Square Pharma	99-2000	-0.000000000019	0.100672	6.97470341	0.005696
Square Pharma	2000-2001	0.000000000031	0.224158	-4.8227374	0.004983
Square Pharma	2001-2002	-0.000000000003	0.026395	5.83220259	0.00773
Square Pharma	2002-2003	-0.000000000003	0.24611	-2.4981377	0.007447
Square Pharma	2003-2004	-0.000000000006	0.120961	3.62256667	0.007224
Square Pharma	2004-2005	0.000000000009	0.106541	-1.9342961	0.007018
Square Pharma	2005-2006	0.000000000000	0.120963	2.85105792	0.007175
Square Pharma	2006-2007	-0.000000000002	0.18355	-1.2834711	0.030754
Square Pharma	2007-2008	-0.000000000001	0.087148	2.16633147	0.026812
Square Pharma	2008-2009	-0.000000000005	0.147202	-0.7690429	0.020211
Square Pharma	2009-2010	-0.000000000004	0.140553	1.92106225	0.016088
Square Pharma	2010-2011	-0.000000000002	0.129509	-0.4824512	0.015275
Apex Foods Ltd.	1995-96	0.000000000000	0	27.1643878	0.000912
Apex Foods Ltd.	96-97	0.000000000139	-0.33132	0	0.001221
Apex Foods Ltd.	97-98	-0.000000000170	-0.10786	-0.4148442	0.001779
Apex Foods Ltd.	98-99	0.000000000194	-0.64995	-0.2800606	0.002728
Apex Foods Ltd.	99-00	0.000000000060	0.485374	-0.2112036	0.001743
Apex Foods Ltd.	00-01	0.000000000118	0.188691	0.3242703	0.00121
Apex Foods Ltd.	2001-2002	0.000000000234	0.085077	0.19659463	0.001191
Apex Foods Ltd.	2002-2003	0.000000000178	0.176393	0.09326947	0.000997
Apex Foods Ltd.	2003-2004	-0.000000000087	0.145069	0.20897191	0.000803
Apex Foods Ltd.	2004-2005	-0.000000000021	-0.09378	0.15397305	0.001795
Apex Foods Ltd.	2005-2006	-0.000000000043	0.153363	-0.1007807	0.001905
Apex Foods Ltd.	2006-2007	-0.000000000003	-0.01304	0.20115899	0.001675

Apex Foods Ltd.	2007-2008	-0.000000000075	0.344023	0.32872768	0.000997
Apex Foods Ltd.	2008-2009	0.000000000048	-0.21194	-0.0710635	0.001124
Apex Foods Ltd.	2009-2010	-0.000000000022	0.167842	-0.1950894	0.000831
Apex Foods Ltd.	2010-2011	0.000000000073	0.315724	0.11216982	0.000602
Agni Systems Ltd.	2003-04	0.000000000000	0	27.1610688	0.176854
Agni Systems Ltd.	2004-05	-0.000000001750	-0.85726	0	0.221195
Agni Systems Ltd.	2005-06	-0.000000000889	0.887435	0.06808453	0.212179
Agni Systems Ltd.	2006-07	0.000000000402	-0.53452	0.04610564	0.107217
Agni Systems Ltd.	2007-08	0.000000000356	0.658305	-2.5166324	0.087889
Agni Systems Ltd.	2008-09	0.000000000037	-0.2487	-0.1023466	0.06714
Agni Systems Ltd.	2009-10	0.000000000263	0.303233	-0.575183	0.01924
Agni Systems Ltd.	2010-11	0.000000000531	-0.33093	0.75504054	0.02885
Atlas Bangladesh Ltd.	95-96	0.000000000000	0	0.09924909	0.001677
Atlas Bangladesh Ltd.	96-97	-0.000000000194	0.075812	0	0.001397
Atlas Bangladesh Ltd.	97-98	0.000000000318	-0.0822	0.46165161	0.001932
Atlas Bangladesh Ltd.	98-99	0.000000000100	0.143719	-0.0669441	0.002975
Atlas Bangladesh Ltd.	99-00	0.000000000258	0.135736	0.21320616	0.002288
Atlas Bangladesh Ltd.	00-01	-0.000000000428	0.105327	0.14149041	0.001814
Atlas Bangladesh Ltd.	2001-02	0.000000000045	0.259324	0.03469786	0.001151
Atlas Bangladesh Ltd.	2002-03	-0.000000000036	0.066715	0.2202187	0.001388
Atlas Bangladesh Ltd.	2003-04	0.000000000070	0.132542	0.02752534	0.001169
Atlas Bangladesh Ltd.	2004-05	-0.000000000018	0.254184	0.11380623	0.000795
Atlas Bangladesh Ltd.	2005-06	0.000000000071	0.186656	0.20622496	0.000788
Atlas Bangladesh Ltd.	2006-07	0.000000000001	0.139471	0.16836754	0.000653

Atlas Bangladesh Ltd.	2007-08	0.000000000001	-0.011	0.10757683	0
Atlas Bangladesh Ltd.	2008-09	0.000000000022	0.498109	0.20257423	0
Atlas Bangladesh Ltd.	2009-10	-0.000000000075	-0.95541	0.49657458	0.000643
Atlas Bangladesh Ltd.	2010-11	-0.000000000031	0.317775	0.20050021	0.000697
Bangladesh Lamps Ltd.	1996	0.000000000000	0	2.18763966	0.000356
Bangladesh Lamps Ltd.	1997	0.000000000301	-1.25792	0	0.000372
Bangladesh Lamps Ltd.	1998	0.000000000279	0.760115	-0.0272118	0.000365
Bangladesh Lamps Ltd.	1999	0.000000000006	-1.17291	-0.0630335	6.78E-05
Bangladesh Lamps Ltd.	2000	-0.000000000261	0.365369	-0.0774234	6.18E-05
Bangladesh Lamps Ltd.	2001	0.000000000108	-0.79223	0.02341449	0.000209
Bangladesh Lamps Ltd.	2002	-0.000000000244	-0.11023	-0.0071347	0.000442
Bangladesh Lamps Ltd.	2003	-0.000000000413	-0.7484	-0.1676045	0.00041
Bangladesh Lamps Ltd.	2004	-0.000000000079	0.099773	0.02144228	0.000711
Bangladesh Lamps Ltd.	2005	-0.000000000363	-0.76041	0.00683036	0.001259
Bangladesh Lamps Ltd.	2006	0.000000000193	0.156639	0.0426846	0.001605
Bangladesh Lamps Ltd.	2007	-0.000000000614	-0.63028	0.07813204	0.001306
Bangladesh Lamps Ltd.	2008	0.000000000136	0.40278	0.0586223	0.000859
Bangladesh Lamps Ltd.	2009	-0.000000000058	-0.37482	0.27347264	0.000659
Bangladesh Lamps Ltd.	2010	-0.000000000016	0.099826	0.1200937	0.000671
Bangladesh Lamps Ltd.	2011	0.000000000000	-0.34025	0.01296702	0.001372
Gemini Sea Food Ltd.	1995-96	0.000000000000	0	0.29213139	0.001537
Gemini Sea Food Ltd.	1996-97	0.000000000000	0.246001	0	0.001068
Gemini Sea Food Ltd.	1997-98	0.000000000000	0.150173	0.18716455	0.002351
Gemini Sea Food Ltd.	1998-99	0.000000000000	-0.38258	0.37435839	0.001731

Gemini Sea Food Ltd.	1999-2000	-0.000000000276	0.592992	-0.1815715	0.000651
Gemini Sea Food Ltd.	2000-01	-0.000000000159	0.053959	0.56511296	0.000669
Gemini Sea Food Ltd.	2001-02	-0.000000000254	-0.56066	0.03901121	0.000945
Gemini Sea Food Ltd.	2002-03	-0.000000000267	0.252505	-0.4007019	0.000891
Gemini Sea Food Ltd.	2003-04	0.000000000011	0.216996	0.23829633	0.000976
Gemini Sea Food Ltd.	2004-05	0.000000000265	0.049106	0.15487936	0.000794
Gemini Sea Food Ltd.	2005-06	-0.000000000004	0.233443	0.10349129	0.000726
Gemini Sea Food Ltd.	2006-07	0.000000000001	-0.07514	0.29610355	0.000666
Gemini Sea Food Ltd.	2007-08	-0.000000000104	-0.18645	-0.0502324	0.000761
Gemini Sea Food Ltd.	2008-09	-0.000000000184	-0.16227	-0.0834935	0.00076
Gemini Sea Food Ltd.	2009-10	-0.000000000255	-1.29808	-0.3915134	0.002988
Gemini Sea Food Ltd.	2010-11	-0.000000000013	0.508351	-1.6069137	0.001743
GSK LTd.	1996	0.000000000000	0	-0.114738	0.02694
GSK LTd.	1997	0.000000000033	0.035503	0	0.031592
GSK LTd.	1998	0.000000000087	0.113694	0.24689617	0.034459
GSK LTd.	1999	-0.000000000062	0.013775	0.22208009	0.027268
GSK LTd.	2000	-0.000000000035	0.11962	0.01450545	0.02753
GSK LTd.	2001	-0.000000000011	0.152478	0.06972974	0.027277
GSK LTd.	2002	0.000000000036	0.082678	0.10649125	0.027642
GSK LTd.	2003	-0.000000000150	0.051786	0.04436698	0.026991
GSK LTd.	2004	0.000000000119	-0.02448	0.09693376	0.029084
GSK LTd.	2005	0.000000000020	0.030972	-0.0150278	0.029687
GSK LTd.	2006	-0.000000000021	0.068949	0.05699197	0.0321
GSK LTd.	2007	-0.000000000038	-0.01333	0.11759938	0.030866

GSK LTd.	2008	0.000000000119	0.098229	0.03445306	0.025899
GSK LTd.	2009	-0.000000000042	0.379494	0.05322866	0.018062
GSK LTd.	2010	-0.000000000029	0.177012	0.25306359	0.014782
GSK LTd.	2011	-0.000000000021	0.281455	0.10599433	0.014235
Olympic Industries Ltd.	95-96	0.000000000000	0	3.7626912	0.001134
Olympic Industries Ltd.	96-97	0.000000000730	0.108906	0	0.000655
Olympic Industries Ltd.	97-98	0.000000000028	0.084523	-0.0081998	0.145436
Olympic Industries Ltd.	98-99	0.000000000005	0.012229	0.0680498	0.004985
Olympic Industries Ltd.	99-00	-0.000000000048	0.006421	0.08108863	0.010692
Olympic Industries Ltd.	00-01	-0.000000000265	0.13884	-0.0065263	0.011284
Olympic Industries Ltd.	2001-02	-0.000000000263	-0.03605	0.10297967	0.003442
Olympic Industries Ltd.	2002-03	-0.000000000224	0.184798	-0.0141331	0.002541
Olympic Industries Ltd.	2003-04	-0.000000000265	0.211316	0.12373538	0.002261
Olympic Industries Ltd.	2004-05	-0.000000000193	0.093886	0.18550449	0.00327
Olympic Industries Ltd.	2005-06	-0.000000000117	0.312142	0.05774482	0.002912
Olympic Industries Ltd.	2006-07	-0.000000000053	0.01346	-2.8462166	0.003222
Olympic Industries Ltd.	2007-08	-0.000000000025	0.272067	-0.8204216	0.002568
Olympic Industries Ltd.	2008-09	-0.000000000082	0.296314	-0.7597736	0.002095
Olympic Industries Ltd.	2009-10	-0.000000000043	0.154514	-0.2638043	0.009389
Olympic Industries Ltd.	2010-11	-0.000000000014	0.364656	1.7136165	0.005691
Prime Textile Ltd.	95-96	0.000000000000	0	0.57674355	0.037927
Prime Textile Ltd.	96-97	0.000000000000	-0.17761	0	0.032423
Prime Textile Ltd.	97-98	-0.000000000091	0.354357	0.68205894	0.042471
Prime Textile Ltd.	98-99	-0.000000000063	-0.01504	0.41901524	0.00521

Prime Textile Ltd.	99-00	-0.000000000044	0.262847	0.22377024	0.002489
Prime Textile Ltd.	00-01	-0.000000000043	0.062665	0.65064165	0.003095
Prime Textile Ltd.	2001-02	-0.000000000075	-0.25708	0.04345514	0.002348
Prime Textile Ltd.	2002-03	0.000000000000	0.213342	-0.4398923	0.002502
Prime Textile Ltd.	2003-04	-0.000000000032	0.208364	-0.0135425	0.004351
Prime Textile Ltd.	2004-05	-0.000000000046	-0.02283	-0.5583624	0.006019
Prime Textile Ltd.	2005-06	-0.000000000028	0.010986	0.05915575	0.00627
Prime Textile Ltd.	2006-07	0.000000000000	0.045588	0.10268861	0.004354
Prime Textile Ltd.	2007-08	0.000000000000	-0.02325	-0.0689049	0.003909
Prime Textile Ltd.	2008-09	0.000000000000	-0.06226	-0.5619355	0
Prime Textile Ltd.	2009-10	0.000000000000	-0.04269	0.31812343	0
Prime Textile Ltd.	2010-11	-0.000000000002	0.36852	1.31959108	0
Reckit Benckiser Ltd.	96	0.000000000000	0	3.90522273	0.017334
Reckit Benckiser Ltd.	97	-0.000000000372	-0.01843	0	0.019565
Reckit Benckiser Ltd.	98	0.000000000177	0.108576	0.20657855	0.023088
Reckit Benckiser Ltd.	99	-0.000000000449	0.131081	0.12505576	0.034263
Reckit Benckiser Ltd.	2000	-0.000000000620	0.214926	0.06241427	0.026604
Reckit Benckiser Ltd.	2001	0.000000000350	0.01965	0.15067023	0.03011
Reckit Benckiser Ltd.	2002	-0.000000000120	-0.2361	0.16711884	0.052798
Reckit Benckiser Ltd.	2003	-0.000000000285	0.176723	-0.156314	0.038411
Reckit Benckiser Ltd.	2004	-0.000000000176	0.165408	0.007254	0.030455
Reckit Benckiser Ltd.	2005	-0.000000000104	0.254514	0.08821626	0.014637
Reckit Benckiser Ltd.	2006	-0.000000000111	0.253123	0.15315607	0.013937
Reckit Benckiser Ltd.	2007	0.000000000000	0.217833	0.14474744	0

Reckit Benckiser Ltd.	2008	-0.000000000058	0.124857	-0.5771755	0
Reckit Benckiser Ltd.	2009	0.000000000180	0.074869	0.76988013	0
Reckit Benckiser Ltd.	2010	0.000000000000	0.079772	0.06271192	0
Reckit Benckiser Ltd.	2011	0.000000000000	0.034411	-0.7446408	0
Daffodil Computers Ltd.	2005-06	0.000000000000	0	0	0.025496
Daffodil Computers Ltd.	2006-07	-0.000000000135	-0.20061	0	0.026161
Daffodil Computers Ltd.	2007-08	-0.000000000795	-0.186	-0.2563551	0.036982
Daffodil Computers Ltd.	2008-09	-0.000000000478	0.123085	-0.0935239	0.032877
Daffodil Computers Ltd.	2009-10	-0.000000000703	0.108488	0.02619551	0
Daffodil Computers Ltd.	2010-11	0.000000000112	0.11275	-0.0126464	0
Malek Spining Ltd.	2009-10	0.000000000000	0	0.0208304	0.000814
Malek Spining Ltd.	2010-11	-0.000000000010	0.393811	0	0.001028
Golden Son Ltd.	2006-07	0.000000000000	10.55939	23.3585379	0
Golden Son Ltd.	2008	-0.000000000090	0.133425	0	0
Golden Son Ltd.	2009	-0.000000000127	0.325035	-19.998082	0.038635
Golden Son Ltd.	2010	-0.000000000327	0.155312	-0.4119378	0.016032
Golden Son Ltd.	2011	0.000000000734	0.326033	0.13693593	0.012047

Annexe-7

Data for neutrality and timeliness

Data for neutrality and timeliness:

Company Name	Year	EPS	Year-end Market price	Reporting Lag
ACI Ltd.	1996	1.66	225.17	324
ACI Ltd.	1997	3.73	50.02	204
ACI Ltd.	1998	3.26	31.01	140
ACI Ltd.	1999	3.6	26.85	174
ACI Ltd.	2000	3.97	56.3	177
ACI Ltd.	2001	5.67	55.31	178
ACI Ltd.	2002	6.75	54.19	189
ACI Ltd.	2003	5.28	66.7	174
ACI Ltd.	2004	5.5	94.4	173
ACI Ltd.	2005	6.94	69.6	173
ACI Ltd.	2006	9.51	70.2	177
ACI Ltd.	2007	19.36	181.7	144
ACI Ltd.	2008	66.52	521.3	169
ACI Ltd.	2009	50.85	447.1	167
ACI Ltd.	2010	30.49	372.6	166
ACI Ltd.	2011	12.11	206.6	164
Square Pharma	95-1996	n/a	n/a	n/a
Square Pharma	96-1997	n/a	788	125
Square Pharma	97-1998	85.03	971.33	135
Square Pharma	98-1999	114.27	786.43	135
Square Pharma	99-2000	146.48	687	204
Square Pharma	2000-2001	167.26	817	174
Square Pharma	2001-2002	229.47	1341	166
Square Pharma	2002-2003	303.78	1261	174
Square Pharma	2003-2004	254.96	1178	178
Square Pharma	2004-2005	269.46	2272	174
Square Pharma	2005-2006	290.91	3768	174
Square Pharma	2006-2007	234.67	2276	174
Square Pharma	2007-2008	218.61	2447	165
Square Pharma	2008-2009	154.53	4110	169
Square Pharma	2009-2010	156.56	2935	160
Square Pharma	2010-2011	138.36	3581	174
Apex Foods Ltd.	1995-96	129.07	3272	174
Apex Foods Ltd.	96-97	n/a	n/a	n/a
Apex Foods Ltd.	97-98	181	3308	168
Apex Foods Ltd.	98-99	47.8	2075	181
Apex Foods Ltd.	99-00	19.57	966	165
Apex Foods Ltd.	00-01	-50.16	374	152
Apex Foods Ltd.	2001-2002	16.05	357	162
Apex Foods Ltd.	2002-2003	16.58	367.52	175
Apex Foods Ltd.	2003-2004	14.92	250	153
Apex Foods Ltd.	2004-2005	22.75	318	122
Apex Foods Ltd.	2005-2006	26.29	440	115
Apex Foods Ltd.	2006-2007	22.77	520	114

Apex Foods Ltd.	2007-2008	21.76	349	83
Apex Foods Ltd.	2008-2009	58.28	218	89
Apex Foods Ltd.	2009-2010	36.68	1225	108
Apex Foods Ltd.	2010-2011	-15.66	1012	89
Agni Systems Ltd.	2003-04	15.01	1016	87
Agni Systems Ltd.	2004-05	18.93	962	91
Agni Systems Ltd.	2005-06	n/a	n/a	n/a
Agni Systems Ltd.	2006-07	11.8	15.4	110
Agni Systems Ltd.	2007-08	13	28.1	172
Agni Systems Ltd.	2008-09	1.28	18.1	111
Agni Systems Ltd.	2009-10	0.9	39.7	149
Agni Systems Ltd.	2010-11	1.16	47.01	n/a
Atlas Bangladesh Ltd.	95-96	16.48	179.04	176
Atlas Bangladesh Ltd.	96-97	22.39	307.50	181
Atlas Bangladesh Ltd.	97-98	23.77	221.18	177
Atlas Bangladesh Ltd.	98-99	19.31	120.00	183
Atlas Bangladesh Ltd.	99-00	8.76	139.80	167
Atlas Bangladesh Ltd.	00-01	21.00	134.20	180
Atlas Bangladesh Ltd.	2001-02	45.18	158.40	179
Atlas Bangladesh Ltd.	2002-03	39.34	216.36	176
Atlas Bangladesh Ltd.	2003-04	25.44	275.20	175
Atlas Bangladesh Ltd.	2004-05	17.33	337.30	180
Atlas Bangladesh Ltd.	2005-06	11.97	201.60	not possible
Atlas Bangladesh Ltd.	2006-07	12.62	308.60	166
Atlas Bangladesh Ltd.	2007-08	36.68	1,225.00	108
Atlas Bangladesh Ltd.	2008-09	11.49	477.70	177
Atlas Bangladesh Ltd.	2009-10	15.01	1,016.00	87
Atlas Bangladesh Ltd.	2010-11	18.93	962.00	91
Bangladesh Lamps Ltd.	1996	103.30	7,981.00	265
Bangladesh Lamps Ltd.	1997	34.80	1,485.00	252
Bangladesh Lamps Ltd.	1998	24.50	638.00	259
Bangladesh Lamps Ltd.	1999	9.20	536.00	269
Bangladesh Lamps Ltd.	2000	2.20	571.50	343
Bangladesh Lamps Ltd.	2001	21.20	320.00	175
Bangladesh Lamps Ltd.	2002	20.00	386.50	179
Bangladesh Lamps Ltd.	2003	30.00	450.50	176
Bangladesh Lamps Ltd.	2004	45.40	830.50	165
Bangladesh Lamps Ltd.	2005	48.50	611.30	149
Bangladesh Lamps Ltd.	2006	47.30	485.30	140
Bangladesh Lamps Ltd.	2007	49.10	752.00	150
Bangladesh Lamps Ltd.	2008	76.70	1,096.80	139
Bangladesh Lamps Ltd.	2009	81.20	1,849.30	132
Bangladesh Lamps Ltd.	2010	85.70	2,613.50	131
Bangladesh Lamps Ltd.	2011	6.50	200.00	128
Gemini Sea Food Ltd.	1995-96	n/a	819.38	91
Gemini Sea Food Ltd.	1996-97	n/a	130.00	89
Gemini Sea Food Ltd.	1997-98	n/a	165.00	73
Gemini Sea Food Ltd.	1998-99	n/a	138.00	87
Gemini Sea Food Ltd.	1999-2000	n/a	136.75	79
Gemini Sea Food Ltd.	2000-01	n/a	215.00	88
Gemini Sea Food Ltd.	2001-02	n/a	195.00	73
Gemini Sea Food Ltd.	2002-03	n/a	315.00	72

Gemini Sea Food Ltd.	2003-04	38.78	415.00	70
Gemini Sea Food Ltd.	2004-05	57.54	550.00	72
Gemini Sea Food Ltd.	2005-06	44.16	625.00	78
Gemini Sea Food Ltd.	2006-07	38.09	520.00	79
Gemini Sea Food Ltd.	2007-08	42.64	496.50	65
Gemini Sea Food Ltd.	2008-09	25.57	1,695.25	73
Gemini Sea Food Ltd.	2009-10	36.95	1,507.50	72
Gemini Sea Food Ltd.	2010-11	94.76	3,139.00	88
GSK LTd.	1996	6.56	223.25	117
GSK LTd.	1997	6.78	102.68	120
GSK LTd.	1998	6.56	61.00	140
GSK LTd.	1999	5.02	145.00	128
GSK LTd.	2000	5.31	96.00	137
GSK LTd.	2001	4.51	100.00	147
GSK LTd.	2002	6.00	104.00	146
GSK LTd.	2003	7.21	119.00	140
GSK LTd.	2004	15.23	171.00	139
GSK LTd.	2005	-4.05	137.00	146
GSK LTd.	2006	-1.42	135.50	144
GSK LTd.	2007	3.74	193.00	143
GSK LTd.	2008	11.87	330.10	120
GSK LTd.	2009	26.88	725.10	112
GSK LTd.	2010	34.05	1,129.60	118
GSK LTd.	2011	23.42	664.50	115
Olympic Industries Ltd.	95-96	n/a	584.67	274
Olympic Industries Ltd.	96-97	27.25	686.00	266
Olympic Industries Ltd.	97-98	14.52	206.71	not possible
Olympic Industries Ltd.	98-99	3.15	138.59	not possible
Olympic Industries Ltd.	99-00	-2.52	108.00	192
Olympic Industries Ltd.	00-01	-10.27	129.50	638
Olympic Industries Ltd.	2001-02	-10.88	101.66	not possible
Olympic Industries Ltd.	2002-03	6.73	102.38	268
Olympic Industries Ltd.	2003-04	7.58	139.94	274
Olympic Industries Ltd.	2004-05	7.34	197.49	266
Olympic Industries Ltd.	2005-06	13.96	107.27	177
Olympic Industries Ltd.	2006-07	18.84	146.67	180
Olympic Industries Ltd.	2007-08	23.41	400.95	181
Olympic Industries Ltd.	2008-09	66.57	631.65	170
Olympic Industries Ltd.	2009-10	82.34	1,816.00	183
Olympic Industries Ltd.	2010-11	73.57	1,889.98	182
Prime Textile Ltd.	95-96	15.78	280.00	363
Prime Textile Ltd.	96-97	10.71	176.00	363
Prime Textile Ltd.	97-98	-30.69	104.84	263
Prime Textile Ltd.	98-99	-22.09	48.95	269
Prime Textile Ltd.	99-00	13.50	48.50	190
Prime Textile Ltd.	00-01	13.09	111.75	194
Prime Textile Ltd.	2001-02	6.94	75.50	181
Prime Textile Ltd.	2002-03	7.23	62.84	182
Prime Textile Ltd.	2003-04	8.02	74.50	180
Prime Textile Ltd.	2004-05	7.00	65.25	177
Prime Textile Ltd.	2005-06	11.19	51.50	157
Prime Textile Ltd.	2006-07	15.99	61.75	not possible
Prime Textile Ltd.	2007-08	21.89	144.25	not possible

Prime Textile Ltd.	2008-09	12.46	231.50	not possible
Prime Textile Ltd.	2009-10	11.00	474.25	not possible
Prime Textile Ltd.	2010-11	18.15	534.50	154
Reckit Benckiser Ltd.	96	6.26	199.20	37
Reckit Benckiser Ltd.	97	4.83	130.63	79
Reckit Benckiser Ltd.	98	5.15	77.82	105
Reckit Benckiser Ltd.	99	6.16	67.35	113
Reckit Benckiser Ltd.	2000	12.61	77.00	137
Reckit Benckiser Ltd.	2001	6.48	89.80	146
Reckit Benckiser Ltd.	2002	-8.01	93.40	145
Reckit Benckiser Ltd.	2003	5.41	92.50	115
Reckit Benckiser Ltd.	2004	8.10	129.03	93
Reckit Benckiser Ltd.	2005	15.00	119.20	106
Reckit Benckiser Ltd.	2006	23.19	182.00	94
Reckit Benckiser Ltd.	2007	29.50	373.00	145
Reckit Benckiser Ltd.	2008	35.05	443.00	123
Reckit Benckiser Ltd.	2009	41.90	1,556.40	136
Reckit Benckiser Ltd.	2010	26.71	1,214.00	134
Reckit Benckiser Ltd.	2011	28.37	774.50	144
Daffodil Computers Ltd.	2005-06	1.39	13.30	181
Daffodil Computers Ltd.	2006-07	0.69	15.00	184
Daffodil Computers Ltd.	2007-08	0.47	31.40	184
Daffodil Computers Ltd.	2008-09	0.70	35.20	177
Daffodil Computers Ltd.	2009-10	0.63	43.40	155
Daffodil Computers Ltd.	2010-11	0.94	25.40	182
Malek Spining Ltd.	2009-10	1.51	98.90	180
Malek Spining Ltd.	2010-11	0.64	57.10	180
Golden Son Ltd.	2006-07	0.38	20.00	273
Golden Son Ltd.	2008	1.52	46.00	169
Golden Son Ltd.	2009	2.61	55.50	170
Golden Son Ltd.	2010	3.54	102.30	169
Golden Son Ltd.	2011	3.86	61.10	174

Annexe-8

Data for Relevance Items

Data for relevance items:

Company Name	Year	Average assets	ROA	Earnings before EOI and DO
ACI Ltd.	1996	n/a	n/a	12223533
ACI Ltd.	1997	709175700	0.0463279	32854634
ACI Ltd.	1998	764634643	0.0688876	52673879
ACI Ltd.	1999	896520710	0.0649833	58258879
ACI Ltd.	2000	1008374749	0.012122	12223533
ACI Ltd.	2001	1103685536	0.0830992	91715428
ACI Ltd.	2002	1353538739	0.0806631	109180668
ACI Ltd.	2003	1760502926	0.0485167	85413760
ACI Ltd.	2004	2193914320	0.0408021	89516202
ACI Ltd.	2005	2526592119	0.0444357	112270813
ACI Ltd.	2006	2794841482	0.0550391	153825615
ACI Ltd.	2007	3823001007	n/a	153825615
ACI Ltd.	2008	5822958658	n/a	1075666883
ACI Ltd.	2009	8300686845	0.1188628	986642683
ACI Ltd.	2010	9686269568	0.0610751	591590014
ACI Ltd.	2011	10391620363	0.065546	681129073
Square Pharma	95-1996	n/a	n/a	170442516
Square Pharma	96-1997	1589540523	0.1337388	212583209
Square Pharma	97-1998	1589540523	0.1797174	285668014
Square Pharma	98-1999	1589540523	0.230385	366206276
Square Pharma	99-2000	1589540523	0.260548	414151545
Square Pharma	2000-2001	1589540523	0.3609075	573677043
Square Pharma	2001-2002	4169576553	0.1821403	759447753
Square Pharma	2002-2003	4846306797	0.1578284	764885000
Square Pharma	2003-2004	5517290500	0.1758189	970044000
Square Pharma	2004-2005	6889096831	0.182295	1255848153
Square Pharma	2005-2006	8603459987	0.1355111	1165864616
Square Pharma	2006-2007	9892963658	0.1317343	1303242840
Square Pharma	2007-2008	11595033712	0.1191772	1381863093
Square Pharma	2008-2009	12977185138	0.1456443	1890052929
Square Pharma	2009-2010	14140371567	0.1476532	2087871791
Square Pharma	2010-2011	17236954966	0.1468969	2532054550
Apex Foods Ltd.	1995-96	n/a	n/a	34312706
Apex Foods Ltd.	96-97	524950896.5	0.051919	27254909
Apex Foods Ltd.	97-98	601709530.5	0.0185476	11160257
Apex Foods Ltd.	98-99	608652161	-0.0469959	-28604143
Apex Foods Ltd.	99-00	649282116	0.0140961	9152342
Apex Foods Ltd.	00-01	527207986.5	0.0179348	9455359
Apex Foods Ltd.	2001-2002	415230462	0.0204932	8509386
Apex Foods Ltd.	2002-2003	444824358	0.0291611	12971548
Apex Foods Ltd.	2003-2004	450801603.5	0.0332582	14992835
Apex Foods Ltd.	2004-2005	724215043	0.0179275	12983382
Apex Foods Ltd.	2005-2006	955116421.5	0.0129943	12411104

Apex Foods Ltd.	2006-2007	893876169	0.0547719	48959256
Apex Foods Ltd.	2007-2008	654189428.5	0.0361867	23672984
Apex Foods Ltd.	2008-2009	728190567.5	-0.0122645	-8930907
Apex Foods Ltd.	2009-2010	789675250	0.010839	8559275.00
Apex Foods Ltd.	2010-2011	1026069883	0.0105205	10794736.00
Agni Systems Ltd.	2003-04	n/a	n/a	9058627
Agni Systems Ltd.	2004-05	71806209	0.1449301	10406883
Agni Systems Ltd.	2005-06	109203462.5	0.1035341	11306281
Agni Systems Ltd.	2006-07	160736065	0.0739782	11890969
Agni Systems Ltd.	2007-08	216797186.5	0.0849551	18418019
Agni Systems Ltd.	2008-09	240375449	0.1238643	29773935
Agni Systems Ltd.	2009-10	271159775	0.1310382	35532296
Agni Systems Ltd.	2010-11	516171136	0.0808534	12223533
Atlas Bangladesh Ltd.	95-96	n/a	0.1505556	30,473,130
Atlas Bangladesh Ltd.	96-97	223,119,042	0.1344769	33,591,827
Atlas Bangladesh Ltd.	97-98	265,129,491	0.1017814	35,653,790
Atlas Bangladesh Ltd.	98-99	284,643,390	0.0450367	28,971,403
Atlas Bangladesh Ltd.	99-00	291,910,226	0.1002125	13,146,680
Atlas Bangladesh Ltd.	00-01	314,465,130	0.1879531	31,513,323
Atlas Bangladesh Ltd.	2001-02	360,585,370	0.1948034	67,773,123
Atlas Bangladesh Ltd.	2002-03	454,376,946	0.1363086	88,514,160
Atlas Bangladesh Ltd.	2003-04	559,838,794	0.1083046	76,310,845
Atlas Bangladesh Ltd.	2004-05	640,059,422	0.1013509	69,321,366
Atlas Bangladesh Ltd.	2005-06	708,357,747	0.1320504	71,792,700
Atlas Bangladesh Ltd.	2006-07	765,022,405	0.0264138	101,021,500
Atlas Bangladesh Ltd.	2007-08	896,234,503	0.1948782	23,672,984
Atlas Bangladesh Ltd.	2008-09	1,148,867,418	0.0070398	223,889,202
Atlas Bangladesh Ltd.	2009-10	1,215,835,133	0.0082378	8,559,275
Atlas Bangladesh Ltd.	2010-11	1,310,392,870	n/a	10,794,736
Bangladesh Lamps Ltd.	1996	n/a	0.0760854	37,249,280
Bangladesh Lamps Ltd.	1997	330,438,680	0.0407494	25,141,566
Bangladesh Lamps Ltd.	1998	435,535,641	0.0128965	17,747,824
Bangladesh Lamps Ltd.	1999	508,925,638	0.0031135	6,563,360
Bangladesh Lamps Ltd.	2000	523,170,888	0.0295686	1,628,870
Bangladesh Lamps Ltd.	2001	515,758,598	0.0273994	15,250,284
Bangladesh Lamps Ltd.	2002	524,190,850	0.042975	14,362,526
Bangladesh Lamps Ltd.	2003	499,330,581	0.0598741	21,458,711
Bangladesh Lamps Ltd.	2004	547,536,869	0.0593157	32,783,264
Bangladesh Lamps Ltd.	2005	588,938,603	0.0563829	34,933,325
Bangladesh Lamps Ltd.	2006	605,324,452	0.0577166	34,129,952
Bangladesh Lamps Ltd.	2007	612,787,968	0.0852153	35,368,046
Bangladesh Lamps Ltd.	2008	649,168,961	0.0654158	55,319,149
Bangladesh Lamps Ltd.	2009	894,415,721	0.0474636	58,508,890
Bangladesh Lamps Ltd.	2010	1,300,989,991	0.0324828	61,749,642
Bangladesh Lamps Ltd.	2011	1,451,377,104	n/a	47,144,733
Gemini Sea Food Ltd.	1995-96	n/a	n/a	852,239
Gemini Sea Food Ltd.	1996-97	97,745,507	n/a	1,216,892
Gemini Sea Food Ltd.	1997-98	109,332,826	n/a	1,415,188
Gemini Sea Food Ltd.	1998-99	133,482,434	0.0283037	-4,528,922
Gemini Sea Food Ltd.	1999-2000	156,015,502	-0.0743071	4,415,816
Gemini Sea Food Ltd.	2000-01	173,085,970	0.013201	-12,861,515
Gemini Sea Food Ltd.	2001-02	189,795,854	0.0138491	2,505,493

Gemini Sea Food Ltd.	2002-03	225,929,391	0.017495	3,128,928
Gemini Sea Food Ltd.	2003-04	243,840,185	0.021934	4,265,989
Gemini Sea Food Ltd.	2004-05	288,563,107	0.0263595	6,329,340
Gemini Sea Food Ltd.	2005-06	336,017,971	0.0468581	8,857,254
Gemini Sea Food Ltd.	2006-07	344,167,731	0.0364371	16,127,037
Gemini Sea Food Ltd.	2007-08	360,168,465	0.0345335	13,123,490
Gemini Sea Food Ltd.	2008-09	325,650,355	0.0275563	11,245,833
Gemini Sea Food Ltd.	2009-10	257,125,103	0.0654219	7,085,405
Gemini Sea Food Ltd.	2010-11	246,178,443	n/a	16,105,472
GSK LTd.	1996	n/	0.1239489	79,061,000
GSK LTd.	1997	658,989,500	0.1092698	81,681,000
GSK LTd.	1998	723,109,500	0.0761593	79,014,000
GSK LTd.	1999	793,928,500	0.0789172	60,465,000
GSK LTd.	2000	810,305,000	0.0660911	63,947,000
GSK LTd.	2001	822,334,500	0.0829707	54,349,000
GSK LTd.	2002	870,729,500	0.0864977	72,245,000
GSK LTd.	2003	1,003,714,000	0.1656492	86,819,000
GSK LTd.	2004	1,107,871,000	0.0448818	183,518,000
GSK LTd.	2005	1,088,325,500	-0.0164335	48,846,000
GSK LTd.	2006	1,041,895,000	0.0668402	-17,122,000
GSK LTd.	2007	673,966,000	0.4199084	45,048,000
GSK LTd.	2008	340,429,000	0.3166014	142,949,000
GSK LTd.	2009	1,022,696,000	0.2094991	323,787,000
GSK LTd.	2010	1,957,893,500	0.1171442	410,177,000
GSK LTd.	2011	2,407,869,500	n/a	282,068,000
Olympic Industries Ltd.	95-96	n/a	0.0457228	21,371,713
Olympic Industries Ltd.	96-97	520,866,567	0.0296766	23,815,495
Olympic Industries Ltd.	97-98	606,673,404	0.0073454	18,004,013
Olympic Industries Ltd.	98-99	682,361,227	-0.006175	5,012,240
Olympic Industries Ltd.	99-00	705,576,475	-0.026675	-4,356,948
Olympic Industries Ltd.	00-01	666,003,427	-0.0304802	-17,765,626
Olympic Industries Ltd.	2001-02	617,514,150	0.0195955	-18,821,968
Olympic Industries Ltd.	2002-03	593,681,482	0.0208111	11,633,471
Olympic Industries Ltd.	2003-04	629,596,977	0.01859	13,102,586
Olympic Industries Ltd.	2004-05	683,185,788	0.0352009	12,700,429
Olympic Industries Ltd.	2005-06	685,939,439	0.0487545	24,145,683
Olympic Industries Ltd.	2006-07	668,102,187	0.0876246	32,573,003
Olympic Industries Ltd.	2007-08	715,381,103	0.1462294	62,684,991
Olympic Industries Ltd.	2008-09	880,847,817	0.1621325	128,805,888
Olympic Industries Ltd.	2009-10	1,179,098,513	0.1595231	191,170,188
Olympic Industries Ltd.	2010-11	1,606,118,002	n/a	256,212,992
Prime Textile Ltd.	95-96	n/a	n/a	60,279,335
Prime Textile Ltd.	96-97	2,268,692,237	-0.0573839	40,918,740
Prime Textile Ltd.	97-98	2,402,477,269	-0.0345327	-137,863,505
Prime Textile Ltd.	98-99	2,443,964,937	0.0195024	-84,396,610
Prime Textile Ltd.	99-00	2,643,786,616	0.0153823	51,560,098
Prime Textile Ltd.	00-01	3,250,469,556	0.009215	49,999,696
Prime Textile Ltd.	2001-02	3,089,691,950	n/a	28,471,614
Prime Textile Ltd.	2002-03	2,558,648,693	0.0083357	27,625,512
Prime Textile Ltd.	2003-04	2,581,770,455	0.0083951	21,520,784
Prime Textile Ltd.	2004-05	2,472,627,123	0.0164295	20,757,884
Prime Textile Ltd.	2005-06	2,468,639,382	n/a	40,558,524
Prime Textile Ltd.	2006-07	2,452,715,285	n/a	53,351,445

Prime Textile Ltd.	2007-08	2,505,152,049	n/a	71,090,507
Prime Textile Ltd.	2008-09	3,171,991,096	n/a	40,447,567
Prime Textile Ltd.	2009-10	3,746,684,346	0.0189309	52,184,660
Prime Textile Ltd.	2010-11	3,662,038,794	n/a	69,325,849
Reckit Benckiser Ltd.	96	n/a	0.0926672	26,483,717
Reckit Benckiser Ltd.	97	239,528,791	0.0923482	22,196,456
Reckit Benckiser Ltd.	98	260,604,827	0.1119883	24,066,377
Reckit Benckiser Ltd.	99	259,989,295	0.1926946	29,115,764
Reckit Benckiser Ltd.	2000	309,268,150	0.0738778	59,594,292
Reckit Benckiser Ltd.	2001	414,588,360	-0.0982241	30,628,891
Reckit Benckiser Ltd.	2002	385,183,706	0.0821562	-37,834,320
Reckit Benckiser Ltd.	2003	311,343,352	0.1090854	25,578,776
Reckit Benckiser Ltd.	2004	351,044,495	0.1648673	38,293,823
Reckit Benckiser Ltd.	2005	429,899,506	0.1958019	70,876,359
Reckit Benckiser Ltd.	2006	559,710,307	n/a	109,592,335
Reckit Benckiser Ltd.	2007	765,105,595	0.1707593	139,398,899
Reckit Benckiser Ltd.	2008	969,915,172	0.2214039	165,622,010
Reckit Benckiser Ltd.	2009	894,170,954	n/a	197,972,944
Reckit Benckiser Ltd.	2010	778,869,587	n/a	126,216,280
Reckit Benckiser Ltd.	2011	5,633,925,418	n/a	134,061,961
Daffodil Computers Ltd.	2005-06	n/a	0.0358163	24,277,262
Daffodil Computers Ltd.	2006-07	336,629,722	0.0266702	12,056,827
Daffodil Computers Ltd.	2007-08	339,670,046	0.0441531	9,059,053
Daffodil Computers Ltd.	2008-09	322,109,984	0.0455554	14,222,140
Daffodil Computers Ltd.	2009-10	317,636,390	0.0695772	14,470,049
Daffodil Computers Ltd.	2010-11	490,062,289	n/a	34,097,174
Malek Spining Ltd.	2009-10	n/a	0.0072361	156,189,632
Malek Spining Ltd.	2010-11	14,090,255,483	n/a	101,958,317
Golden Son Ltd.	2006-07	n/a	0.0451577	4,987,362
Golden Son Ltd.	2008	508,733,556	0.0855715	22,973,254
Golden Son Ltd.	2009	543,562,097	0.4738864	46,513,445
Golden Son Ltd.	2010	369,385,421	1.2046408	175,046,721
Golden Son Ltd.	2011	340,567,308	0.1505556	410,261,257