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The impact of investment in accounting information systems on business performance: the case of the Libyan commercial banks

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I declare that the work in this thesis was carried out in accordance with the regulations of the University of Gloucestershire and is original except where indicated by specific reference in the text. No part of the thesis has been submitted as part of any other academic award. The thesis has not been presented to any other education institution in the United Kingdom or overseas.

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ABSTRACT

This study aimed to explore investment in accounting information system (AIS) in the commercial banks in Libya. It focuses on the extent and nature of AIS investment in the Libyan commercial banks, resultant changes in business processes and the significance of training and up-skilling of the workforce in delivering systems benefits.

Following an initial literature review, the research reviewed AIS investment in all Libyan commercial banks and established top line profiles of nine of the thirteen existing banks (the other four being close to merger with, or acquisition by, other banks). Three banks were selected for detailed case study analysis, representing a cross-section in terms of size, staff, age profile, and ownership of the banks. Three methods were adopted to collect data - individual questionnaires with key bank personnel, semi-structured interviews and review and analysis of pertinent bank documents.

The study researched and analysed the recent investment in advanced IT in the case study banks, where AIS packaged software and communications infrastructure had been implemented. The banks that use developed global systems have more efficient and effective systems than the banks that use local systems, and in general there are no adequate policies or plans in place for training and up-skilling of staff using these new systems. The study also found that investment in AIS and associated technological infrastructure had impacted on all main business processes, bringing about significant process improvement in some cases. Contributions to knowledge include a qualitative assessment of AIS in Libyan banks, which has not been done before, and the identification of some of the benefits and problems that result from major systems deployment. The study has also shown that models formulated for application in the developed world can be adapted and applied to assess information systems in a developing world commercial environment.

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DEDICATED TO

My Mother

My Wife

My Children
Ali and Ayham

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Chapter 1:

Introduction to the Research

Chapter 1 : Introduction to the Research

1.1 Introduction

The main purpose of this introductory chapter is to present an overview of the design and implementation of this study. This chapter has been divided into two main sections. Section 1.2 discusses the rationale and context of the study and also presents the research objectives. Section 1.3 presents an overview of Libya and the Libyan economy development including the history of banks in Libya and an overview of operating banks in Libya.

1.2 Rationale and Context of the Study

Over the past two decades, the banking industry has witnessed an enormous wave of development, which was the direct result of various factors, one of the most important being information technology (IT) development. Most banks consider IT as a route for service quality improvement, while others perceive it as a cost-effective expansion strategy (Kim and Davidson, 2004). Whatever the underlying strategy, there is a consensus regarding the importance of understanding the patterns of IT adopted by bank customers (Pikkarainen et al, 2004). It is very important here to note that there are many studies emphasising that financial institutions such as banks are distinguished from other businesses in the amounts of IT they use. Porter and Millar (1985), for instance, have found that banking is one of the most information-intensive sectors. Banks are tending to use IT to improve the quality of their services, increase efficiency and customer satisfaction, and offer wider choices with lower costs to the customer. In other words, banks are using IT for competitive advantage.

Lang and Colgate (2003) claim that the relationships between service providers and their customers have been noted to be of importance in the banking industry. Moreover, information systems (IS) have played an important role in different life aspects. In the business world, IS investment has been applied to support a range of functional and process areas in operational, technical and strategic fields. Accounting information systems (AIS) provide valuable information to a range of external users and internal users of accounting data (Romney and Steinbart, 2003). The purpose of accounting information system is to produce financial statements such as the Statement of Comprehensive Income, the Statement of Financial Position and other reports used by managers, creditors, current

and potential investors and others. The data produced by AIS is considered an essential source of key information for the organisation. It plays a major role in informing financial decisions either operational or regarding investment or funding. These decisions contribute to improving the organisation's position and give competitive advantage, reflected in the market value of the organisation, and therefore its sustainability in the marketplace.

The banking sector is among the different economic sectors where the use of AIS has increased significantly in recent years, as it has contributed to banking operations, reducing cost and time and improving the quality of services delivered to the customers.

The building or rebuilding of AIS is a costly process, which requires significant effort, time and money at every stage of their creation (planning, analysis, design, development, implementation and upgrades). Many studies have tried to show a direct impact of either accounting or IT on performance. However, several recent studies have shown that the fit between accounting and contextual factors, or between IT and contextual factors, have significant impact on performance (Ismail and King, 2005). Therefore, this investment should contribute to the organisation's subsequent long-term productivity and profitability. This can be done through good IS management and proper training and skills enhancement. It is also dependent on the knowledge of how to use these systems in an effective manner, to support the need of the decision makers and strategic planners. This will normally entail change and improvements in the basic business processes of the organisation.

Almighrawi (2004) studied accounting systems in Libyan commercial banks. She found that most accounting systems used in Libyan commercial banks did not have the features nor the specifications of the modern accounting systems; she found also that most Libyan banks did not have skilled and efficient staff to operate modern accounting systems. She recommended the adoption of advanced technology in the banking industry to provide developed and modern services to customers. She recommended also that there should be a programme to qualify and train staff on new technology in the banking sector as well as in the area of communications. Recently there has been a general trend in Libyan banks toward investment in advanced IT, so this study will try to answer the questions postulated in section 1.3 below.

1.3 Research Questions

This research will explore investment in accounting information system (AIS) and business performance in commercial banks in Libya.

This will be done by addressing the following questions:

1. What is the extent and nature of AIS investment in Libyan commercial banks?
2. Has investment in AIS resulted in significant change in business processes? If so, what role has this played in improving business performance in Libyan commercial banks?
3. How important is training and up-skilling of the workforce in making sure the benefits of investment are delivered?

1.4 Research Aim and Objectives

The aim of this study is to first discover the extent and nature of accounting information system investment in Libyan commercial banks. Second, it will research and analyse process change that accompanies significant investment in accounting information systems and third, the significance of people skills and related training programmes in delivering systems benefits will be assessed. The results of the study could be used as a source for IS strategy development and implementation in Libyan banks. Moreover, it will add to the existing limited literature about this subject in the developing and non-western environments. The presence of AIS in an organisation is accompanied by capital and operating expenditure which is part and parcel of this overall investment. It is desirable to have an appropriate balance between these investments and the expected returns. This will also be investigated as part of the research of the relationship between investment in accounting information systems and business performance. In line with the above discussion, this research aims:

- To explore investment in accounting information system (AIS) in the commercial banks in Libya.
- To map and analyse the business processes linked to the deployment of AIS, and determine their significance in overall business improvement.
- To identify the influence of training and upskilling of the workforce on the accomplishment of investment benefits in Libyan commercial banks.
- To determine how business performance has been influenced by investment in AIS

This research project has focused on the investment in AIS in the commercial banks in Libya and this sector was selected as the site for the case for a number of following reasons:-

- No previous study has been conducted in the impact of investment in accounting information systems on business performance in the Libyan commercial banks.
- There is economical and socio-political importance of this sector for Libyan society. The banking sector in Libya has been used to encourage economic development.
- The Libyan economy has been passing through a period of development and reform such as privatisation, establishment of new private banks and entry of foreign banks to the banking market.
- Banking is one of the economy's most active and sophisticated sectors.
- It is the most important developed and updated sector, which plays a significant role in the Libyan economy.

1.5 Thesis structure

This thesis consists of an introductory chapter and five further chapters; Figure 1-1 shows the thesis structure. The thesis is structured as follows:

Chapter 2: Theoretical contributions and review of relevant literature

This chapter will complete the review of literature relevant to the research questions, including detailed reviews of information systems and information technology literature.

Chapter 3: Research Methodology

This chapter presents the research methodology used in this study. This will cover the philosophy of research methodology, research data collecting methods, and target community and sampling banks and groups.

Chapter 4: An explorative study of extent and nature of AIS investment in Libyan commercial banks

The first phase of this study is to discover the extent and nature of accounting information systems currently adopted by Libyan commercial banks, and also to determine the number of banks that are appropriate for inclusion in the main data gathering phase.

Chapter 5: Research Findings

This chapter presents a general descriptive analysis of the data collected and provides a descriptive analysis of the characteristics of respondents. Moreover, main business function and IS profiling at three cases are discussed.

Chapter 6: Cases Study Analysis

This chapter will summarise the overview and findings of the current study by representing the background of the current research, a summary of its objectives, and a discussion of the findings with respect to the developed theoretical framework. In addition, to help answer the first research question, process function maps were first used to depict the deployment of different AIS software to support bank activities.

Chapter 7: Conclusion and recommendation for further research

This chapter aims to assess the purpose of this study and reinforce the contributions of this research, its limitations, and potential for future

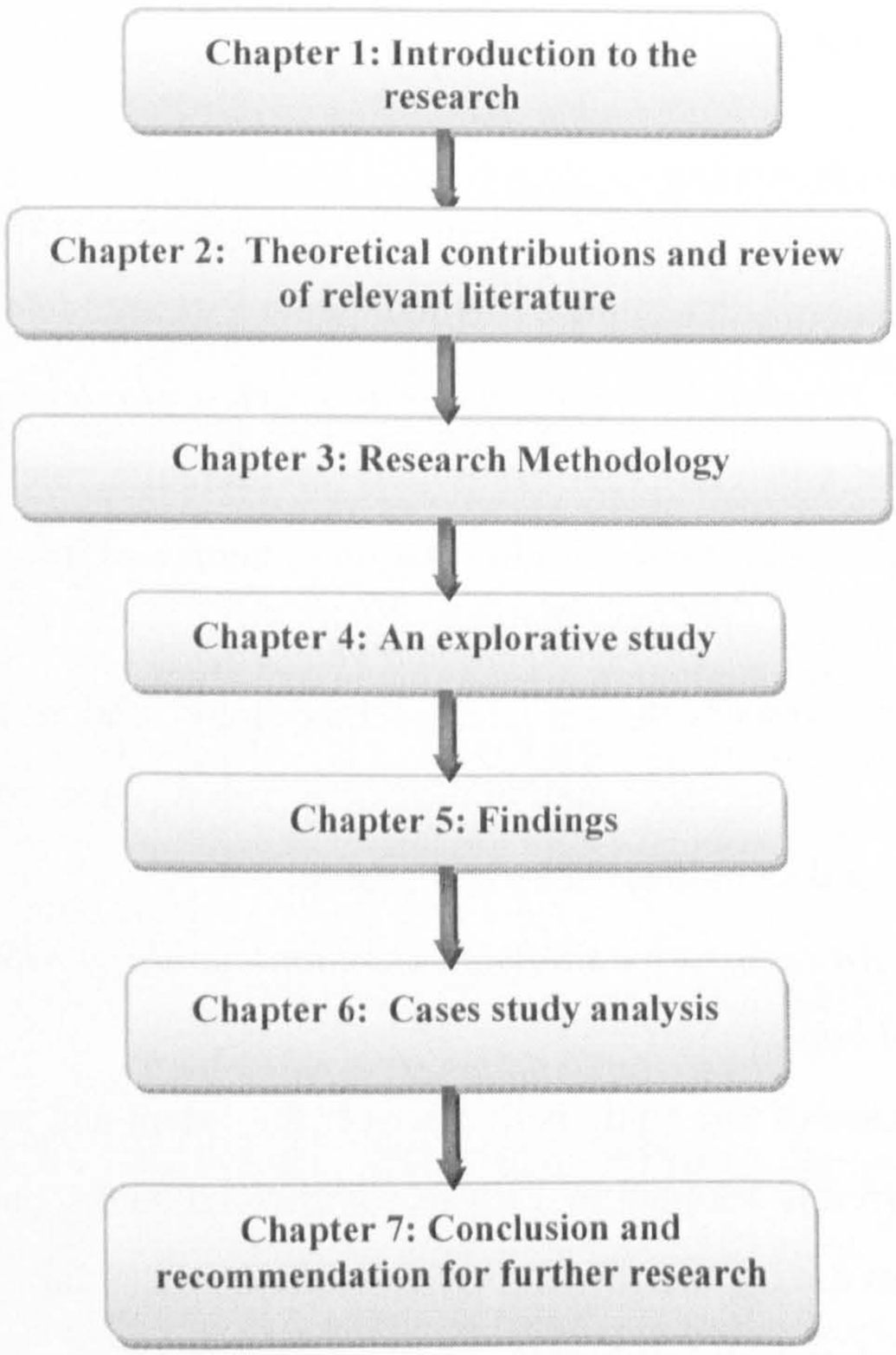


Figure 1-1 Structure of the Thesis

CHAPTER 2:
Theoretical Contributions and Review of Relevant Literature

Chapter 2 : Theoretical Contributions and Review of Relevant Literature

2.1 Introduction

This chapter will complete the review of literature relevant to the research questions, including detailed reviews of information system and information technology literature. For instance, the concept of information systems and its importance, components of the information systems, the role of information systems in organisations and their impact on the organisation's processes and performance will be explored. Moreover, this chapter will examine the concept of accounting information system, and contribution and investment requirements for accounting information systems. Accounting systems in commercial banks will be examined in detail. In addition, the impact of the development of information technology on banking accounting systems and usage of electronic accounting information systems in commercial banks will be reviewed. Furthermore, previous studies which will support this study will be discussed.

2.2 Definitions of Key Concepts

- **Information Technology (IT)**

In these days, managers are seeking the best ways to use information technology to support them for decision-making and problem-solving, especially in rapidly development environment in information technology area. Thus the information technology enables management to predict and respond quickly (Porter et al., 1985). The dynamic nature of the environment change creates many opportunities and threats. Hence, most companies attempt to know and scan the environment to reduce uncertainty and to facilitate effective decisions (Dallaire, 1992). As mentioned before, IT has influenced what is known as information systems. Hence, it is worth distinguishing between the two terms, information system and information technology. Jimba (1999) has defined information technology as "the various technologies which are used in the creation, acquisition, storage, dissemination, retrieval, manipulation and transmission of information" (p. 80). The UK Department of Industry defined information technology as "the acquisition, processing, storage and dissemination of vocal, pictorial, textual and numeric information by a microelectronics-based combination of computing and telecommunication" (Fletcher,

1999, pp.237-238). This definition echoes that offered by Turban, McLean and Wetherbe (1996), who state that:

> Information technology in its narrow definition, refers to the technological side of an information system. It includes hardware, databases, software networks, and other devices. As such, it can be viewed as a subsystem of an information system. Sometimes, the term IT is also used interchangeably with IS, or it may even be used as a broader concept that describes a collection of several information systems, users, and management for an entire organisation (p.9).

Bocij, Chaffey, Greasley and Hickie (2006) argue that "the stress in information technology is on the technology while information system not only refers to technology, but also to how it is applied and managed to contribute to the business" (p.44).

- **Information System (IS)**

Individuals are involved in the process of decision-making every day. Each time a person is faced with a problem or is dissatisfied with the current status quo, she/he has to make a decision, to solve or to improve. Either way, it seems logical to say that the more information one has, the better will be one's decision. Though this is easy to say, it is quite difficult in reality. Realising the need for information is not enough and additional considerations have to be addressed such as why exactly is the information needed?, what information is required?, when is it needed?, and how can it be acquired?

Before defining an IS, the difference between data and information must be made. Data can be defined as raw facts, consisting of factual elements or comments that describe something, while information represents data that has been processed and provided more insights (Post and Anderson, 2000). Information has also been defined as the reduction of uncertainty (Arrow, as cited in Liebenau and Backhouse, 1990). In other words, data are symbols, means, marks, and individual elements that are rarely used for decision-making; whereas information is data with meanings that are utilised in decision-making (Schultheis and Sumner, 1998). The data source can be anything: a picture, a speech, a document, etc. However, to be useful, data must be organised, managed, and stored, and the resulting information must be meaningful and useful for managers and decision-makers. A system can be defined as "a group of elements that are integrated with the common purpose of achieving an objective"(Bocij et al, 2006, p.37). Organizations need information produced

by the IS in four activities, which are; decision-making, problem solving, controlling operations and providing new products and services (Laudon and Laudon, 2006). These activities are:

- Inputs: capturing or collecting raw data from within the organisation or from its external environment;
- Processing: converting this raw input into a more meaningful form (outputs);
- Outputs: transferring the processed information to the people or activities where it will be used. For example, finished products and human services; and
- Feedback: ISs also require feedback. This is output that is returned to appropriate members of the organisation to help them evaluate or correct the input stage.

Accordingly, IS has been defined in various ways. For instance, Bocij et al. (2006) defined IS as:-

> "a group of interrelated components that work collectively to carry out input, processing, output, storage and control actions in order to convert data into information products that can be used to support forecasting, planning, control, co-ordination, decision-making and operational activities in an organisation" (p.43).

Laudon and Laudon, (2005) said that "An IS can be defined technically as set of interrelated components that collect (or retrieve), process, store, and distribute information to support decision making and control in organisation" (p.8). Beynon-Davies (2002) also defined an IS as follows: "an IS is a system of communication between people. An IS is involved in the gathering, processing, distribution and use of information" (p.4). Other definitions of IS include: "Any organised combination of people, hardware, software, communication network, that transforms, and disseminates information in an organisation" (O'Brien, 2001, p.7), "An IS is an organised set of components for collecting, transmitting, storing, and processing data in order to deliver information to action" (Zwass, 1998, p.5) and "An IS is a collection of components that collect, store, analyse, and disseminate information for a specific purpose" (Turban et al, 1996, p.7).

- **Accounting Information System (AIS)**

In general an accounting system can be defined as an organised set of documents, records, reports and procedures for the preparation and delivery of basic and financial data in a

timely manner with the required accuracy, for decision-making and to identify the extent to which the organisation's objectives have been achieved. Beynon-Davies (2002) has divided up accounting system into three major subsystems as following: Accounts receivable system is usually named a sales ledger. It records all financial amounts that owed by clients to the organisation; Accounts payable system is general named a purchase ledger. It stores financial amounts to suppliers by the organisation; and General ledger system records details all the financial transaction. Stock control system, accounts receivable system and accounts payable system accordingly deliver data to general ledger system. The accounting receivable system and the accounting payable system are fundamental to manage the cash flow.

Bagranoff, Simkin and Norman (2010) said that "accounting is itself an IS that is, a communicative process that collects, stores, processes, and distributes information to those who need it" (p.9). A system is composed of interrelated sub-systems; all of them aim to achieve a set of objectives. The accounting information system is one of the components of these systems. It is concerned with collection, classification, processing, analysis and presentation of financial information to stakeholders to make appropriate decisions in a timely manner.

According to Bagranoff et al. (2010) an accounting information system can be defined as "an accounting information system is a collection of data and processing procedures that creates needed information for its users" (p.5). Harrison and Horngren (1992) defined AIS as follows:

> "An accounting information system often called simply an IS, is the combination of personnel, records, and procedures that a business uses to meet its routine needs for financial data. Because each business has different information demands, each uses a different accounting information system is tailored to the specific needs" (P.268).

The definition of AIS that will be adopted for the purposes of this study is as follows; all information systems and associated technologies that support, enable or promote bank operations or functions.

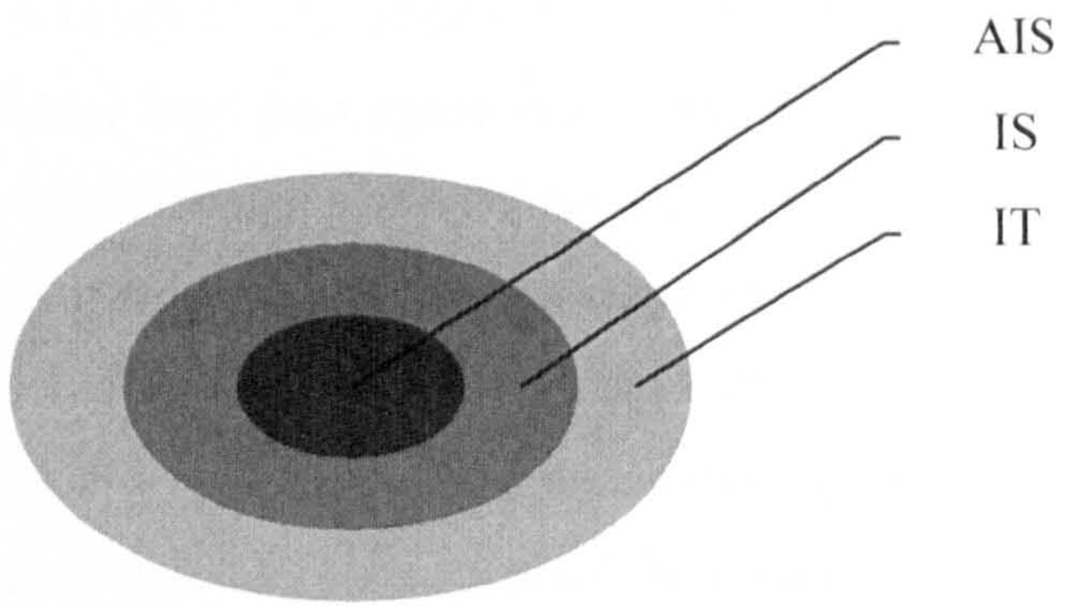


Figure 2-1 The relationship between AIS, IS and IT
(as defined in the majority of existing literature)

One purpose of an accounting information system is to produce the financial statements and other reports used by internal users such managers, and external users such as creditors and interested people. It also generates useful information to non-accountants such as individuals working in finance, marketing and human relations. This is illustrated in figure 2-2.

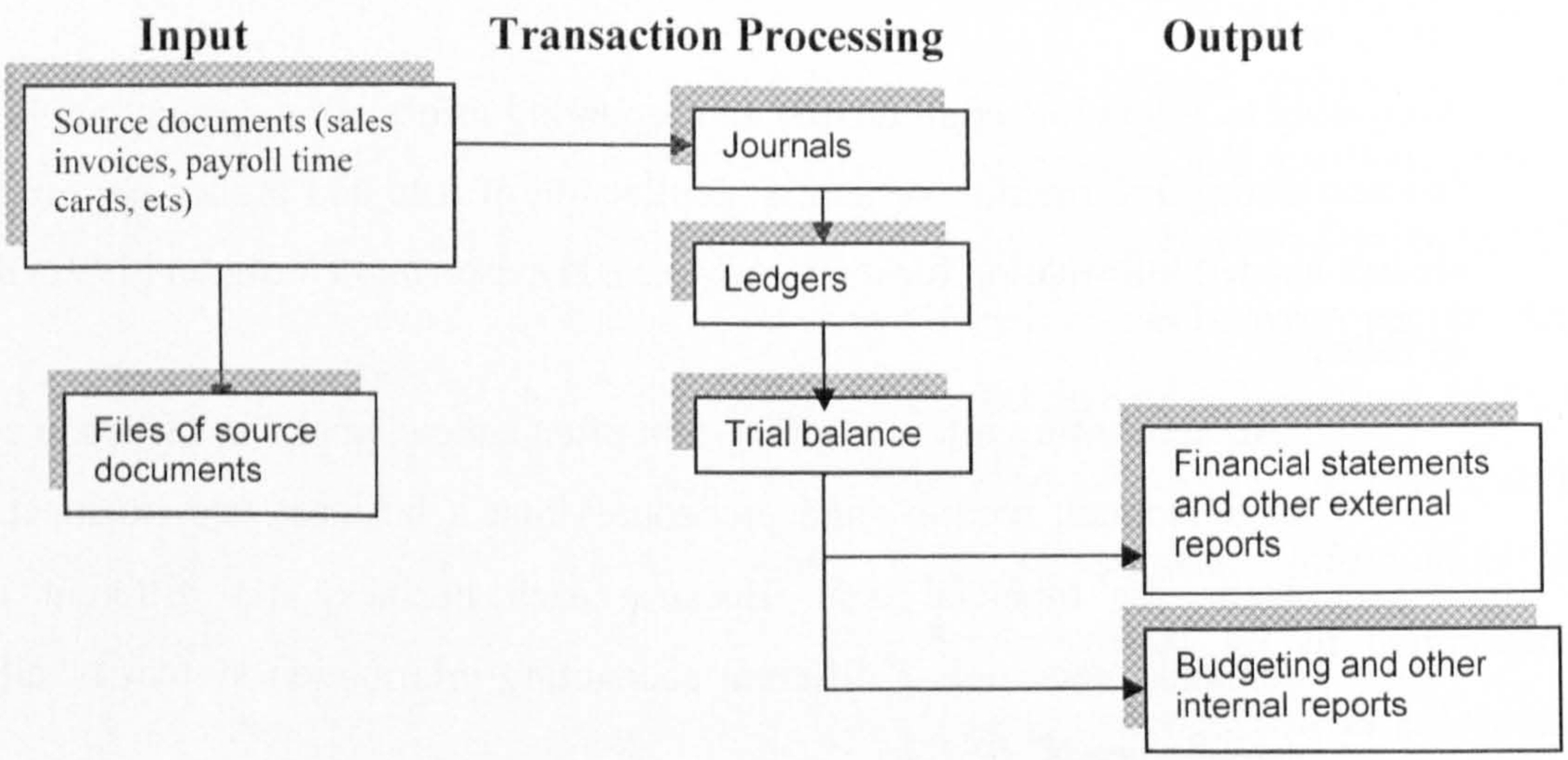


Figure 2-2 AIS transaction processing

2.3 The Importance of Training and Skills

Training concerns increasing, improving, enhancing and modifying employees' skills, abilities, capabilities and knowledge. Thus, they will be able to conduct their current and future jobs effectively, thereby increasing individuals' and organisations' growth and

performance. The need for training has increased dramatically due to the rapidly expanding use of technology within industries and businesses and the continuous threats of knowledge and technology obsolescence.

Training' is viewed by Anderson (1993) as a process which changes employees' behaviour at work through the application of learning principles. This normally focuses on knowledge or information, skills or activities and attitudes, or belief and value systems. in a review of training, Goldstein defined training (as cited in Dixon, 1994,p54) as:

"The acquisition of skills, concepts or attitudes that result in improved performance in an on-the-job situation."

Training is therefore clearly associated with the theories or principles of learning and skill acquisition.

Skill, like learning, is a 'hypothetical construct' (Patrick, 1992) and it can also be applied to a range of performance situations. Moreover, skilled performance has a number of attributes:

- Skills are learned or trained;
- Skills imply coordinated physical or cognitive activity to achieve a goal, and
- Skills imply flexible or adaptive performance.

The vital role that training plays in underpinning the successful implementation of IT strategy is underlined by Straussman (as cited in Dixon, 1994,):

> "Training, training and training: these are the top three priorities to changing work in the automated office... all comparisons of the relative effectiveness between trained and untrained staff attempting to use computers show that office automation is primarily a social and secondarily a technological phenomenon." (p.34)

This emphasises both the importance of adequate training and that the human and organisational implications need to be considered in any IS strategy. Empirical evidence also tends to support this view.

The primary, traditional role of training has been to ensure that the workforce is provided with the knowledge, skills and attitudes necessary to perform a given function well. Thus, the main aims of any training programme are to achieve some kind of change in employees' knowledge, skills, experiences, behaviour and attitudes; also to

- Develop employees' skills and abilities to improve their performance.
- Familiarize employees with new systems, procedures and methods of working.
- Help employees and new starters to become familiar with the requirements of particular jobs in the organisation.
- Help the organisation to improve customer service, satisfaction and total quality in the organisation. (Walton, 1999; Marchington and Wilkinson, 2000)

2.4 Businesses and IT

IT is important for any business or organisation. With technology, companies can give customers access to information about a wide range of products and services. New developments in information technology such as the Internet, telecommunication, Leverick, Littler, Wilson and Bruce (1997) point out that IT allows consumers to participate in product design and manufacturers to respond to customers' needs in a quick manner. There is no doubt that IT plays a key role in helping marketers keep their positions in the market. Porter and Millar (1985) have observed that the IT is influencing the competition in three important ways:

- It changes industry structure and alters the rules of competition. The structure of an industry is embodied in five `competitive forces' that are, the power of buyers, the power of suppliers, the threat of new entrants, and the threat of the substitution of products or services, and rivalry among existing competitors. IT can change an industry's structure by increasing the power of buyers, raising barriers to entry, and influencing the threat of substitution.
- It creates `competitive advantage' by giving companies new ways to outperform their rivals by lowering costs (IT can alter a company's cost in any part of the value chain), enhancing differentiation (IT makes it possible to customise products), and changing `competitive scope' (IT can alter the relationship between `competitive scope' and `competitive advantage', the technology increases a company's ability to co-ordinate its activities regionally, nationally, and globally). In this context, Ryssel, Ritter and Gemunden (2004) have pointed out that companies are part of a marketplace where different types of organisations come together and exchange information, services and products. Therefore in using information technology, a company can do business and interact with other organisations in spite of being geographically dispersed.

- It spawns whole new businesses, often from within a company's existing operations, by making new businesses technologically feasible, creating derived demand for new products and creating new businesses within old ones.

Indeed, IT has many benefits not only for companies, but also for customers. Customers usually look for more convenient ways of dealing with their companies, while companies look for innovative and effective methods to reach their customers. In resorting to information technology, both may be able to make their dreams come true.

2.5 IT in the Banking Sector

Lloyd-Walker and Cheung (1998) pointed out that in the banking industry, IT can help the provision of superior customer services by providing a fast, accurate and reliable service. However, there are many studies emphasising that financial institutions such as banks are distinguished from other businesses in dealing with the quantity of IT (Porter and Millar, 1985; Applegate, McFarlan, and McKenney, 1999; Kim and Davidson, 2004). These institutions must give more attention to IT in order to deal efficiently and effectively with enormous quantities of information. As already mentioned, banking and financial services are among the industries where IT has had the most significant impact. Kim and Davidson (2004) have stated that the banking industry environment has become IT -intensive. Porter and Millar (1985) emphasised that the banking industry has a high IT content in both product and process as do newspapers and airlines, compared with other industries such as oil refining and cement. This is explained in Table 2-1.

Table 2-1 "Information intensity matrix

	Information content of the product		
	Low		High
Information intensity of the value chain	High	Oil Refining	Banking Newspapers Airlines
	Low	Cement"	

Source: Porter and Millar (1985,p.153)

As seen in Figure 2: 1, the banking sector has a high content of information in the services that are offered to customers and a high intensity of information in its operations. Applegate et al. (1999) stressed that the financial institutions are among the industries where IT has the most significant impact. Applegate et al. (1999) explained that the strategic impact of IT as applied to banking is very high; as is the strategic impact of existing operating systems.

Generally, IT is considered the backbone in the financial and banking industry. The banking industry has undergone dramatic change in the last decade.

2.6 The Impact of Developments of IT on Banking and Usage of Electronic AIS in Commercial Banks

Massive and rapid developments in IT have become the decisive factor in the success of institutions. Melinda and Stephen (2001) state "In the American economy, IT now accounts for 41% of total business expenditures on capital equipment, making it the largest line item in the U.S" (p.5). Wallman adn Mowlana (1997) said that the significant rise in the potential of computers, where the energy storage has been increased and the invention of more speed and great potential of new generations. These generations help to process larger volumes of data and reduce the cost of operating at the same time. Furthermore, The use of new areas for preparation of computer programs, such as expert systems, smart research programs and electronic sensors that carry out scanning of a wide range of databases or the websites of the internet to search for specific information and dispose of it according to certain rules. In addition, the use of ATMs affects on the profitability of an organisation in terms of cost saving and better services. According to Holden and Bannany (2004) there are several studies that conclude that investment in ATMs leads to a reduction in banking transaction costs, and the number of staff and branches. AISs which use computers, are advanced ISs compared to conventional systems that use paper documents to record and transfer and deliver data accounting information to beneficial parties by use electronic system. The electronic system of transferring money is widely used by the banks, in order to process a large number of financial transactions, such as withdrawing of funds, transferring and receiving deposits.

The lack of efficiency during the processing of paper documents, and the delay of receiving information for decision–making, encouraged the banks and industrial organisations to develop the electronic AIS as an alternative to traditional AISs.

The American institute of certified public accountants (AICPA) defined the system of electronic transfer of money and information as: a network based on usage of computers for design and implementation of operations of payment systems through use of electronic impulses in computers, instead of using paper-based means. Turner, Turner and Voysey (1994) also stated that the electronic systems of transferring money and accounting information result in more efficiency, less mistakes, better control, a reduction of managerial costs to the minimum and the achievement of efficiency in accounting and rapid modernisation of accounting records.

Moreover, Wigand (1997) defined the system of electronic transfer of money and information as: the full implementation of technology of information and communications, from start to finish in business and financial processes to achieve an organisation's objectives. These processes include the processes between the organisation and other organisations, and between the organisation and its customers.

The definitions of the above-mentioned clarify how the electronic networks change the operations of banks and organisations, in order to reduce transaction costs, provide information for decision-making and achieve better returns from the system. The importance of these systems stems from their role in achieving cost efficiency cost in the commercial bank business. Hence, the AIS must provide the necessary information to assist senior management in supervision and control. It also assists in the assessment of accomplishment in the banking business and its risk.

Information provided by the AIS in banks is subject to, management requirements, the requirements of the central bank and those of external parties such as investors and taxation authority....etc. According to Bascom (as cited in Almighrawi, 2004) the following general guidelines set by central banks, are required to be applied by commercial banks when using the AIS.

- The work of the AIS in commercial banks is based on the recording and follow-up of all operations which are relative to assets, actual obligations or expected and

profits, expenditure paid or payable that resulted from the operation or liabilities of commercial banks.

- The AIS provides details of each operation or obligation of the bank, and shows the related parties of these operations and obligations.
- The AIS provides immediate access to accounting and financial information, which is required by the management to control a bank's assets and activities and to update and prepare data and information continuously for decision-making in a timely manner.
- Maintaining the limits of the authority delegation that is authorised by the senior management, and appropriate to the type, nature and volume of the bank's activity in all its divisions.
- Maintaining the details of methods of financial analysis and rules of acceptance and rejection of some of the processes that are identified by the senior management.
- The banks assume the responsibility for finding procedures to ensure the availability of financial and accounting information, which cover all aspects of the bank's activity and financial situation and risks. Moreover, this information should be provided to the different levels of management on a regular basis and periodically, and procedures are determined to meet the requirements of the bank's policy, including the delegation of authority and requirements of the central bank.
- Commercial banks should have procedures to ensure that the human component is qualified to conduct the accounting business, where the operation of any system depends properly on the experience and the integration of the human component.

The effectiveness of the accounting system depends on its ability to deal with the information, namely receiving, discharging, analysing and storing information in order to be able to maintain and develop itself. In addition, the internet plays a major role in electronic commerce. Gradually, it has become a rapid and reliable mechanism for the completion of business transactions. It also facilitates negotiations, sales, purchases, marketing, research, feasibility studies, and exchange of securities and to permits the transition and flow of money. Moreover, the internet plays a major role in the banking

sector, where it provides all the functions of the basic electronic banking systems, in an efficient manner and at a lower cost.

As a result of the synergy between the technology of computers and communication technology IT has wide capabilities that can be used in different areas of accounting. This situation requires the need for strategic changes in the regulations and practices of accounting as well as in the functions of accountants. The use of electronic data processing systems (EDP) lead to a significant change in the accountant function, where it has reduced the time and routine work that the accountant had spent in the manual recording of economic transactions. Furthermore, the time of the accountant can be used in the analysis of information and managerial decision-making.

Moreover, the prevalence of IT has contributed to the development of the function of managerial accounting, particularly the responsibilities for setting the estimated budget, the preparation of comparisons between actual and estimated or standard elements, and the preparing of appropriate reports and recommendations, which affect various administrative decisions.

The capabilities that are provided by the development of IT in the area of accounting can be summarised as follows:

- The possibility of inputting and processing huge volumes of data, thus saving time and effort to record the accounting entries. By recording an entry of financial transactions once on the computer, the financial process is made more efficient.
- The ensuring of complete accuracy during the making of accounting operations with high speed, and minimising of errors that occur with the use of manual records.
- The possibility of presentation and analysis of data in non-traditional form and tables.
- The speed of access for achieving and displaying of accounting information with limited cost.
- The possibility of immediate modernisation of the published accounting information in a timely manner.
- Increasing the quantity and quality of published information.

- The possibility of deployment (spread) of the accounting information widely by using the internet.

2.7 Investment in ISs

ISs rely on a set of interrelated elements and parts, which interact with each other to achieve a common objective or objectives, as follows:- People who are users of the system, such as accountants, engineers, clients and managers, as well as people who operate and prepare the system such as analysts and designers of the system, equipment which includes computers and related devices used in the operation and entry of data and output information, data is the raw material, which is processed by the system in order to provide management needed information, networks, which are the infrastructure for a communication between computers and responsible programs for managing the communication between devices, database, which is the container that contains stored basic data, which should be available to carry out operation processes.

The IS involves cost and this can be divided into cost that can be measured and cost that is difficult to measure. The costs that can be measured are, for example, equipment, hardware, software, people, operating and training, while the costs that are difficult to measure include, lack of loyalty, lack of satisfaction and non operational efficiency. The cost of the IS that can be measured can be divided into:

Capital costs: cost of purchasing new equipment and programs, cost of user training, cost of site preparation and cost of conversion to new systems. Accordingly, the cost of equipment and devices depend on the required energy and volume of transactions that will be done by the system. The preparation and installation costs are usually estimated as a rate of purchase value of the basic equipment. The cost of implementing the system usually includes the costs that will result from the adoption of the new system. In addition, costs of training of employees on new equipment and the developing and preparing of the programs are measurable rewards, together with the remuneration costs paid to experts to supervise the new system. Moreover, the operation cost of the system is in accordance with the desired characteristics of the new system, such as accuracy, flexibility and the timely delivery of requested information.

The main purpose of investment in IS is to improve performance quality, resource usage, and customer services, as well as reducing costs and developing the capability of

employees (Melinda and Stephen, 2001). However, they said that different definitions of IT investment also leas to conflicting results when some researchers studied the relationship between IT investment and firm performance. According to Bagranoff, Simkin and Strand (2005) IT refers to the hardware and software used in computerised ISs. Consequently, requirements of investment in IS as follows:-

Firstly: Obtaining of Hardware

In recent years, the development of IT has become tangible and has a substantial effect on the lifespan of central units for data processing. There are several available alternatives to get new equipment. Instead of purchasing the equipment, the organisation could hire it for short-time or long-time with the right of purchase after the expiration of the lease. It is difficult to choose between these alternatives due to several economic considerations, particularly tax consequences that will result from the decision. In some cases, the need for additional hardware and software is clear and realistic for economic reasons. On the other hand, in some cases there might be uncertainty, as to whether it was necessary to obtain additional devices or the same objectives can be achieved by improving or developing existing devices.

Secondly: Software selection and procurement

Often, a good application program has a significant impact on choice between different types of computers. The organisation may prefer to obtain less efficient computers for availability of application programs that are appropriate to the requirements of the AIS. An organisation differentiates between available application programs, according to whether it is using electronic IS for the first time or developing of current programs. The responsibility for obtaining, developing and maintaining electronic AISs is among the main functions of a computer centre in many organisations. Initially, organisations often use simple ISs to meet their basic needs for data processing, then modify and develop these programs from time to time.

Thirdly: Evaluation and Selection of Software

Deciding to obtain ready-made accounting software is a choice among a large number of suppliers of programs. Multiple types of program and a difference quality have resulted in a difficult choice between a large numbers of alternatives. Of course, cost is still an essential element in the choice, but at the same time costs depend on a large number of

factors that affect the implementation and operation of these programs and IS. Among these factors are a degree of reliance on programs, consistency with used hardware and software, methods of prevention and protection (information security), degree of flexibility and its competence for adjustment and development, staff training to use and maintain programme.

Fourthly: Deployment of Human Resources

The efficiency and effectiveness of the operation of a system depend on human resources, and those who use system's output in management of the organisation. The human element is, therefore, the main focus of the IS, the success or failure of which depends on the economic activity of the organisation. Human resources are necessary to fill functions in each accounting department and centres of ISs which include specialists in data entry, budgets analysts, financial observers, costs accountants, systems analysts and managers of ISs centres. Experience and technical skills are the most important specifications that must be provided in new staff. The expert in data entry and operator of the devices are expected have experience in specifications and characteristics of the devices that are used by the organisation. The job description that is prepared by the organisation often determines the required years of experience for the incumbent of each position. Moreover, knowledge of certain programming languages, types of software system and the databases which are used by the organisation are required. Some organisations use certain types of general tests of mental capacity, including, tests of technical knowledge in the field of electronics. These tests are for assessing the professional and intellectual qualifications of the applicant to fill these positions. The obtaining of new hardware or software includes the need to provide new human resources or additional working hours. This will result in an increase in the employment cost in general.

2.8 Manual and Computer-Based Systems

Recent technological developments have made it cost-effective for many small businesses to satisfy their decision-making, transaction processing and reporting needs using computers (Hicks, 1990). Accordingly, ISs can be distinguished for two basic categories of data processing system (Cushing and Romney, 1987): (1) Manual data processing systems, in which the major share of the data processing load is carried by people; and (2)

Automated data processing (ADP) systems, in which the major share of the data processing load is carried by machines.

The lowest level of sophistication in data processing systems is a completely manual system. Historically, the earliest form of automated data processing system was the punched card system. A vastly more sophisticated level than the punched card system is electronic data processing (EDP), or computer systems. Early AISs were primarily transaction-based systems, which were developed principally to handle day-to-day operations and to provide recordkeeping functions. The development of cost-effective systems, personal computers and communication technology has had a tremendous impact on accounting systems and its expanded role in supporting top-level decision making activities and satisfying information needs within organisations (Hicks, 1990). "With advances in computer hardware technology and software design, accounting systems have evolved from systems that primarily process transaction data to systems that process information and impart knowledge" (Moscove et al, as cited in Taweel, 2001, pp.22-23).

Naturally, computer-based ISs perform functions quickly and accurately, and probably each processing step can be performed at much lower cost by computers than by humans. Kling (as cited in Taweel, 2001) considers the economic role of computer-based systems in terms of cost savings, efficiency and productivity. Moreover "computer-based systems are central to developing a dynamic economy that is competitive internationally" (9.23). Thus "the computerised ISs are essential if modem businesses are to compete nationally and internationally and IT and related skills are `the new wealth of nations" (Elliott and Starkings, as cited in Taweel, 2001, p.23). However, the scale of automation required by an IS increases in direct proportion to the volume of data processing that the system must accomplish (Cushing and Romney, 1987). Cushing and Romney (1987) compared data processing systems conceptually in terms of the relationship between processing costs and the volume of data items processed. They pointed out that in a manual system; most data processing costs are variable relative to volume. Therefore, as processing volume increases, total processing costs increase proportionately and cost per item processed stays relatively constant. On the other hand, fixed costs of facilities represent a significant portion of the cost of a large-scale computer system.

Therefore, as processing volume increases, total-processing costs in an automated system do not increase in the same proportion, and cost per item processed actually declines. Finally, a system of small computers will incur a combination of fixed and variable costs somewhat in between a manual system and a large-scale computer system. Thus "manual systems are suited to low-volume operations, small computer systems to moderate-volume operations, and large-scale computer systems to high volume operations" (Cushing and Romney, 1987, p.16). In a growing organisation the increasing volume of data processing work represents one of the major pressures toward converting from a manual to an automated system. Moreover, technology costs have dropped, "the economics of IT have changed.... We are expecting to see IT cost-performance ratios continue to change in the range of 20 to 30% a year" (Martin, 1995).

One of the earliest applications of computerised processing was transaction, or data processing. So the lowest required level within the AIS is transaction processing, which is performed by computers and has replaced human-bookkeeping. However, the transactions remain pretty much the same (Kling, as cited in Taweel, L, 2001, p.24). Transaction processing involves processing data in volume, and usually requires computers to do simple, repetitive tasks. These tasks are required for basic accounting systems, but transaction processing systems do not lend themselves to preparing the summary reports, custom-design reports, and data the analyses required for upper-level management decisions (Cushing et al., 1987). The artificial intelligence approaches that appear in AIS include neural networks, expert systems and decision support systems that designed to satisfy various users of accounting information (Moscove, Simkin and Bagranoff 2002).

2.9 The Impact of IT and IS on Organisations

There are several studies related to the impact of information technology on performance. Few of them study the impact of specific technology or review the current level of IT use. An example of these studies, Back and Bell (1995), studied how material management is affected by electronic data management; and El-Mashaleh, William and Kang (2005) said that Fischer and his colleagues in their study in 2003 includes a number of case studies about the impact of 4D Computer Aided Design (CAD) on organisation performance. Sriram, Stump and Banerjee (1997) and Sriram and Stump (2004) examined investment in IT in the purchasing function. Rivard (2000) evaluated the level of IT use in design and

construction firms, and found that most organisations often use computers heavily for managerial tasks. Moreover, El-Mashaleh et al (2005) said that Kumar in 2003 reports wide usage of basic tools for accounting, spreadsheets and word-processing. However, he found the use of more advanced tools limited, but he also discloses increasing use of other tools for instance project web-sites especially in larger organisations.

However, there are a number of studies which discuss the subject of information systems and their impact on organisations, and also the extent of their contribution to achieving the objectives pursued by the organisations. Wynn (2009) assessed the development and implementation of information systems strategy in eight SMEs. Using Earl's model of information system strategy development, he found that all eight firms have succeeded in their information system investment. Regardless of the type of information system strategy that was applied, all projects accelerated organisational and operational changes. These changes include significant changes in working practices and attitudes, where the staff who undergo training play a key role in keeping data up-to-date and customer-relevant.

In other study (Wynn, Turner, Abas and Shen, 2009) the use of knowledge transfer to support information systems implementation in three SMEs was investigated. This study suggested a method for information system strategy development and implementation, so that it may be more effective in terms of timescale, cost control and benefits delivery. The study also suggested that a framework for mapping systems is required in order for any important business improvements or changes in procedures to take place.

There are a few studies that have tried to measure the relationship between investment in IT and performance. For example, Weill (1992) tried to measure this relationship in thirty three small and medium sized firms in the manufacturing sector, generating a model to prove the relationship between different management objectives for IT investment and organisation performance. The management objectives related to firm performance, as specified in this study are transactional information technology, strategic information technology and informational information technology. He focused on measuring the effect of information technology on performance and ruled out other influences as far as possible - for instance the economic environment and the structure of industry. The questionnaire was the primary method used to collect data and was supplemented by interviews and

visits. He concluded that the relationship between investment in information technology and performance is complex and circular in nature. However, there was a significant link between previous investment and current performance, and between previous performance and current investment. Moreover, the management objectives had different effects on performance, where transactional information technology had a positive effect, strategic information technology had a negative effect and informational information technology had a neutral effect.

In addition, El-Mashaleh et al (2005) investigated the relationship between organisation performance and usage of IT. Firm performance was measured from a number of viewpoints; "schedule performance, cost performance, safety performance, customer satisfaction, profit, and resource utilisation" (p.7). They used a survey questionnaire to collect data. After using statistical regression between information technology and performance, they found a positive relationship between performance and information technology use.

Bharadwaj, Bharadwaj and Konsynski (1999) investigated the impacts of IT on firm performance. Finance measures such as return on equity (ROE) and return on assets (ROA) were avoided in this study, which adopted a market-based measure of performance. Hence to measure organisation performance in the future, Tobin's q ratio (Bharadwaj et al 1999) was used as a dependent variable. They found that investment in IT generates intangible benefits for organisations. Holden and El-Bannany (2004) also examined the affect of investment in IT system on the profitability of ten British banks. This investment was measured by the number of ATMs in the UK. They used the percentage return on assets after tax (ROA) as a measure of individual bank profitability. They concluded that ATMs have a positive effect on bank profitability by for example, reducing labour and transactions costs. A study by Melinda and Stephen (2001) explored the impact of IT investment on firm performance in the American railroad industry. The framework of the study divided IT investment into four management objectives. These objectives are strategic, tactical, transactional and threshold IT investment. The study collected the annual investment cost and then measured the hours of development effort per objective then combined investment across the four objectives. The findings of the study indicated that IT investment has made a significant contribution to productivity

improvements in the railroad industry. Kim, Xiang and Lee (2009) tried to investigate this impact in the Chinese electronics industry. They adopted a research model for their investigation as follows; IT investment as an independent variable, and the firm performance (dependent variable) was divided into five variables, return on assets (ROA), return on equity (ROE) and profit margin related to cost efficiency, and sales growth and earnings per share growth related to organisational growth. They also compared the size of this impact in the United States. The data was collected from annual reports of 2005. The study resulted to a positive significant relationship between investment in IT and firm performance. A study by Tam (1998) also investigated the impact of IT investment on firm performance. Three business measures were used in this study, namely return on assets (ROA), return on equity (ROE) and return on sales (ROS). The study developed a regression model to estimate the impact of IT investment on these ratios. The study findings confirm the validity of examined relationships between IT and firm performance reported in previous studies.

Kaplan (1998) attempted to find an appropriate framework to assess investment in IT, depending on several key factors. He also stated that other intangible benefits should be considered, such as saving time and effort. Malian and Selto (2001) dealt with the relation between the Balanced Scorecard and the success factors of an organisation, the study resulted that the cost of investment in IT is reflected positively on the company, and is considered one of the most important success factors. Elsabbagh (2003) examined the impact of IT on competitive advantage in the banking sector in Jordan. The study concluded that the information systems contribute to achieving the purposes. So this will be reflected in the ability of the company to compete, and to earn in the long term. Katanati (2002) studied the impact of the use of accounting information on management performance in Jordanian industrial companies. The study concluded there is a positive relation between elements of the system, including the cost of hardware and software and the quality of information system produced by the system.

Trewin (1988) suggested that future research should include investigations of how the changes in the accounting-related use of computers and computer technology affect organisations. In addition, he concluded that ISs interact with humans and their organisations. Humans are continually modifying their behaviour in reaction to external

stimuli. Organisations also change and evolve. As organisation change, the ways in which they interact with ISs already in place may also change. Additionally, technical advancements in ISs will continue. It will remain important for those who make design and implementation decisions to understand how old systems are adapted to changing environments, how those adaptations affect the organisation, and how new systems affect the organisation and its features. Therefore, he states that field-based studies are central to understanding these changes and their effects. ISs and organisations influence one another. Laudon and Laudon (2005) said that:

> "ISs must be aligned with the organisation to provide information that important groups within the organisation need. At the same time, the organisation must be aware of and be open to the influences of ISs in order to benefit from new technology. (p.7)"

Beynon-Davies (2002) argued that the impact of the IS can be considered on a number of levels: individual, on groups and on the organisation as a whole. The effects may be positive or negative. In addition, the adoption of an IS in an organisation has a possibility to cause both intended and unintended effects. Furthermore, ISs normally have a positive contribution to organisation performance or alternatively a negative contribution.

- **Positive Impact**

Organisations usually invest in ISs to be more efficient and to be more effective. Wynn (2009) in studying eight private sector SMEs, found that "the majority of companies attribute some of their growth to their new ISs platforms" (p.85). However, efficiency or effectiveness cannot be delivered by IT by itself. IT can lead to changes in ISs and human activity systems. Accordingly, these changes lead to changes in the efficiency and/or effectiveness of organisations.

In a human activity system efficiency gains can be achieved by optimal exploitation of available resources. Therefore, through comparing inputs (capital and labour) with outputs (production) efficiency gains can be measured. There is another idea based around transaction costs, which are those costs incurred by the organisation costs, such as to locate and communicate with suppliers. Moreover, IT can help organisations reduce the costs associated with such activity. Laudon and Laudon (2005) believed that, through reducing costs of obtaining and analysing information, IT allows organisations to reduce

agency costs, because the supervision of a greater number of employees becomes easier for management. As a result of reducing the number of employees, IT allows organisation to increase revenues. Effectiveness gains include delivering better services and preferable product to the client. Moreover IT can reduce the hierarchical succession of decision making in firms. Laudon and Laudon (2005) said that "IT could bring information directly from operating units to senior managers, thereby eliminating middle managers and their clerical support workers (pp.85-86)". Commercial organisations are concerned with efficiency and effectiveness being strategies to make more money and increase profitability. Efficiency and effectiveness gains reflect on increasing in number of customers and acquiring better competitive position of the organisation.

- **Negative Impact**

There are some basic paradoxes involved with the introduction of IS into organisations. One of the most significant is the productivity paradox. Brynjolfson (1993) considers four main explanations for the productivity paradox:

- Mismeasurement of input and output. A proper indicator of IT impact has yet to be formulated and analysed. Traditional measures, such as the number of service transactions multiplied by their unit value, tend to ignore non-traditional sources of value, such as increased quality and speed of customer service.
- Lags due to learning and adjustment. The long-term lag between cost and benefit may be due to the extensive learning required on the part of the individual, groups and the organisation to fully exploit information technology.
- Mismanagement of information technology. It proposes that organisations have systematically mismanaged and have not planned systematically for the introduction of information technology. This explains the lack of piecemeal benefit from the introduction of IS or information technology.

In addition, Beynon-Davies (2002) state that an IS can have a negative or positive impact on the following dimensions of work:

- The level of skills required, which can be increased or decreased by IS.
- The variety of skills required of the employee can be increased or decreased by use of an IS.

- The utilisation of an IS leads to reduce the volume of the task relative to the overall purpose of the organisation.
- ISs can be designed to increase the autonomy of workers in terms of their responsibility for planning and controlling their own work.
- Social interaction. An IS can be designed to increase or decrease levels of social interaction between workers.

Furthermore, ISs could have positive and negative impact on both employees and customers. Alter (2002) states that "positive impacts involve empowering people to do their work well by making work more enjoyable and by helping people grow professionally. Negative impacts involve eliminating jobs, de-skilling jobs, making jobs less satisfying, creating greater job stress, or reducing personal privacy" (p.299).

The IT systems play a major role in organisations, enabling the organisation to provide services and products of a high quality, low cost and in a timely manner, through the analysis of organisations' operations and redesigning operational processes. Melinda & Guynes (2001) stated that "IT investments as strategic objective, enable organisations to offer new and extended services to customers, and may be measured by analysing changes in the revenue steam of the organisation" (p.2).

In addition, the ISs provided for workers facilitate more rapid communication. For instance, ISs provide data and information about types of customers that can benefit them by setting plans based on this information. ISs provide management with details to enable it to make accurate decisions, and allow it to deal with customers and suppliers twenty-four hours a day. Many organisations rely on ISs in decision-making to improve customer service and develop planning processes and control. In addition, these systems introduce new services such as Electronic – Commerce. The role of ISs can be indicated in the following points:-

The participation in the implementation of the plan, where the ISs can participate in work which was carried out by staff manually according to particular steps and procedures.

Link between planning, implementation and follow-up systems. During the follow-up the IS pursues the necessary information for follow-up, where the follow-up system feeds the implementation system to correct its course. It also feeds the planning system the same information so that future plans can be more objective.

Coordination between works of various sub–systems. The IS plays a key role in the coordination between the sub–systems of the organisation, where data is collected and processed in order to produce and present information when needed.

Systems integration; ISs work on the integration of systems. For example, the integration between procurement and production systems, where in the presence of ISs, the procurement system will meet the production system needs as a kind of integration between the systems.

Managers must understand the nature of competitive position of the organisation and how it competes. This position and competition situation significantly influences the degree to which an IS is strategically important to an organisation, the way investment in IS technologies should be considered and the way planning should be executed.

A function of the IS and its preparation and utilisation is an important one in any organisation. The importance of ISs lies in their ability to achieve many benefits to the organisation such as flexibility and speed of achievement, a reduction costs and in the possibility of providing useful information in a timely manner, IS is also used at operational level and various activities of the organisation. An IS points out the flow of information in an organisation and between organisations. Peppard (1993) said that IT is "the enabling mechanism which facilitates the processing and flow of this information, as well as the technologies used in the physical processing to produce a product or provide a service" (p.5). Moreover, modern ISs are dependent on IT for their effective function. According to Beynon-Davies (2002) the four major elements of contemporary IT are Hardware, Software, Data and Communications technology. Laudon and Laudon (2005) classified ISs according to a functional perspective as following; "Sales and marketing systems, Manufacturing and production systems, Finance and accounting systems and Human resources systems" (p.43). It can be explained in Table 2-2. There are five functional categories; in each of these main functions are sub functions. For each of sub functions there is a major application system. Moreover, Alter (2002) classified IS categories related to specific functional areas of business as follows; "Product design systems, Supply chain systems, Manufacturing systems, Sales and Marketing systems and Finance systems"(p.181). Furthermore, effective ISs are aligned with the human activity systems they support. The more successful ISs are those that correspond to or are aligned

with human activity systems. If the IS is not aligned with the human activity system then failure is a likely consequence. Peppard (1993) argued that to align the IS/ IT strategy with the business strategy, management must be able to bridge the gap between management and the IT professionals. Moreover, aligning IS / IT with existing business strategy requires the development of both an IS strategy and an IT strategy. The key is that business strategy drives ISs / IT strategy. Ismail et al., (2005) investigated whether the AIS alignment is linked to enterprise performance in Malaysian SMEs. They found that the enterprises achieved better performance with high AIS alignment than enterprises with low AIS alignment.

Table 2-2 Types of ISs (Laudon and Laudon, 2005, p. 46)

	Sales/Marketing systems	**Manufacturing/Production systems**	**Finance/Accounting systems**	**Human resource systems**
Major function of system	Customer service Sales management Promotion tracking Price changes Dealer communications	Scheduling Purchasing Shipping/receiving operations	General ledger Billing Cost accounting	Personnel records Benefits Compensation Labour relations Training
Major application systems	Sales order IS Sales commission system Sales support system	Machine control systems Purchase order systems Quality control systems	General ledger payroll Accounts receivable/ payable Funds management systems	Employee records Benefit systems Employee skills inventory

The IS can provide a number of contributions or benefits. For example, work is regulated automatically, errors are reduced and quality and innovative services are provided to the customers. Wynn (2009) found that "the level of benefit that can be attained from significant new IS investment can provide a rapid payback and a sound technology platform to support future corporate growth" (p.89). Some of these benefits can be measured and some of them are difficult to measure. The benefits that can be measured are a reduction in costs incurred by the organisation. However, the contributions that are difficult to measure have a positive impact on the reputation of the organisation, therefore improving profitability and achieving competitive advantage.

The basic objectives of the measurement of the contribution or the benefits of ISs are as follows: Identify the feasibility of establishing the IS based on usage of modern devices, through a comparison of estimated net benefits to users of information with cost of the establishment of the new system; Identify the feasibility of access to certain information or not. If the information which is produced by accounting has no economic value, there is no justification to produce it. In all cases, it may be the main objective of the IS to maximise profitability, but there are other objectives that are expected to be provided by the IS, such as the provision of better services or reduction costs. In addition, some organisations do better than most others because they have special resources, or use their resources more efficiently. These resources have a significant reflect on growth of revenue and productivity. Laudon and Laudon (2005) said that:-

> "Use ISs to produce products and services at a lower price than competitors while enhancing quality and level of service. Use ISs also to enable new products and services, or greatly change the customer convenience in using existing products and services" (p.11).

In addition, using ISs enable organisations to improve their services better than competitors. This target can be accomplished by preparing and analysing data of sales and marketing. Use IS also assists organisations to develop and enhance the relationship with customers and suppliers.

2.10 IS Implementation and Process Change

There are many definitions of the term business process. (Davenport 1993) defined business process as: "A specific ordering of work activities across time and space, with a beginning, an end and clearly identified inputs and outputs: a structure for action" p5. Gladwin and Tumay, as cited in Eatock, 2003) describe a business process as "group of logically related tasks that use resources of the organisation to provide defined results in support of the organisation's objectives" p12. Even though IT is acknowledged as one of the main enablers of business process change, when it comes to capturing the impact that a new information system will have on current or proposed business processes existing modeling techniques appear to be unable to capture the full extent of the impact. This can lead to the expected benefits not being achieved leading in turn to the disappointments that have been reported. (Eatock, 2003)

CPIT model of e-business adoption

Taylor & Murphy (2004) suggest the CPIT model allows better interpretation of e-business adoption by SME's

There are two clearly defined elements:

- The Connect, Publish, Interact and Transform (CPIT) axis which classifies how e-business technologies can be used.
- The business processes or activities that the e-business technologies can be applied to.

The CPIT model does not view the introduction of e-business technologies into different business processes as isolated events (see Foley & Ram 2002). "Instead it demonstrates the integration between activities, using a series of expanding arrows, to reflect how activities interact and overlap" (DTI 2001)

Taylor and Murphy (2004) assert that as e-business adoption increases, e-business activities in different areas of the organisation begin to overlap, and synergies begin to appear which have the potential to create major changes within the organisation.

The model implies that the e-business adoption technologies can be applied to some or even all of the areas of business activity: Logistics and delivery, Finance, Purchasing and procurement (supply-chain), Operations, processing and assembly, Marketing and sales, After sales service.(figure 2.3)

- **Connect:** implementing and using basic Internet technologies "such as e-mail for messaging ...or the Internet for information gathering" (DTI 2001).
- **Publish:** "publishing information using online technologies" (DTI 2001). Publishing is a one way process and involves no interaction between the organisation and the viewer (e.g. a static website used solely for marketing purposes).
- **Interact:** A two way process, "whereby a business allows its customers, suppliers or employees to interact with them online" (DTI 2001). (e.g. a website that allows customers to submit an order online, or a procurement system that allows suppliers to interact with the organisation).

- **Transform:** "A business has used online technologies to fully transform its business processes". This could potentially mean "the redesigning of business processes around online technologies or the complete reinvention of the business model" (DTI 2001)

Zuboff's Models

When assessing the impact of AIS investment on business processes, a number of models can be considered. As early as the mid 1980's, Zuboff (1984) had discussed the likely future impacts of computers on work practices, identifying the three sequential stages of automate – infomate – transfomate as computing impacted industry operations. Building on this basic classification, the UK Government's CPIT (connect-publish-interact-transform) model (Figure 2-3) adapted and extended it to the internet age in an attempt to determine the level of e-business adoption at individual process level (Department of Trade and Industry, 2001). This model has been used successfully in a number of company studies in the UK to assess the level of e-business across an organisation (Taylor and Murphy, 2004); Lau, Wynn and Maryszczak, (2010) used this model to chart the impact of new collaboration and workflow software in an SME and found that "overall, the deployment of new systems points to significant change in all main process areas as new systems capabilities have been adopted" p74. They found that the new system played a significant role in business development, keeping track of sales enquiries, and projects management has been made efficient through the new system.

However, the distinction between e-business and systems deployment in general is now very blurred; as Chaffey (2007) has suggested e-business might well now be considered as 'all electronically mediated information exchanges', and thus some modification to the CPIT model might be appropriate. Indeed, the original concepts of automate – infomate – transfomate are still of value in assessing the impact of IS at process level.

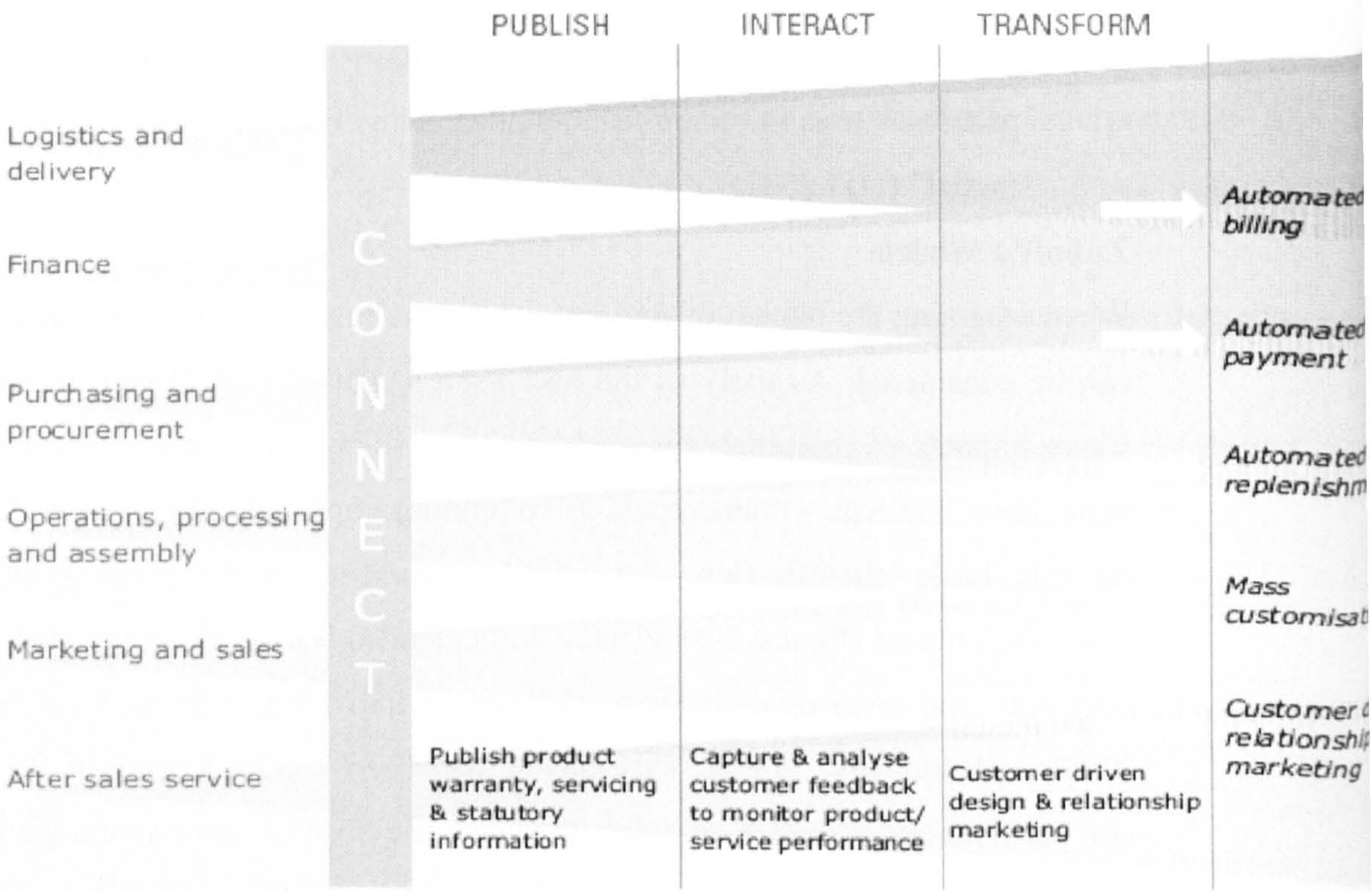


Figure 2-3 The Connect-Publish-Interact-Transform (CPIT) Model

Source: DTI International Benchmarking Study (2001)

Nolan's Model

Nolan's model of the evolution of the IT/IS function in organisations can be used to gauge the general level of IT/IS investment in a business or organisation. This model (Figure 2-4), dating from 1979, is still relevant today, particularly in businesses that have only embarked on significant IS/IT investment in recent years. (Lau, Wynn and Maryszczak, 2010) have used the model for the evolution of the IT/IS function in Optimum Consultancy Services as a case study, where the project has been the catalyst for the advance from a stage of 'contagion', where end-users were developing their own systems in spreadsheets and databases in two separate companies to a 'controlled' and 'integrated' environment with all users accessing one main system. They found that Optimum can now focus on improved management information as it moves to the 'data administration' stage in Nolan's model.

The model depicts six evolutionary stages in the development of the IT/IS function, starting with end-user Initiation of computer use, through Contagion to Control, when an IS/IT department is established, to Systems Integration, Data Administration and Maturity. It is considered a valid and relevant model for supporting the assessment of AIS status in the Libyan banks.

Each evolutionary stage in the development of the IT/IS function means:-

- **Initiation:** The introduction of systems or technology by end-users (often, originally, the finance department).
- **Contagion**: The spread of computing applications into other areas, in a totally uncontrolled manner. Some applications will fail, and the management of IT/IS is chaotic and largely unregulated.
- **Control**: Senior management become concerned at the level of expenditure and lack of control. Responsibility for management is moved to a formal IT/IS department, and support responsibilities are centralised. Applications concentrate on saving money rather than making money.
- **Integration**: Typically, this is where new significant expenditure is made in new systems in an attempt to gain the benefits of technology integration. IT/IS staff may be reorganised into functional areas to support different parts of the business, and only at this stage is there a real dialogue between IT/IS specialists and systems end-users.
- **Data administration**: Developments are driven more by the organisation's need for information; data management and maintenance becomes a key issue in the overall management of the IT/IS function
- **Maturity**: Planning and organisation of the IT/IS function is fully integrated into the business strategy planning and day-to-day management of the organisation. Major applications are 'owned' by end-user management, who also have responsibility for data maintenance, process change and systems upgrade decisions.

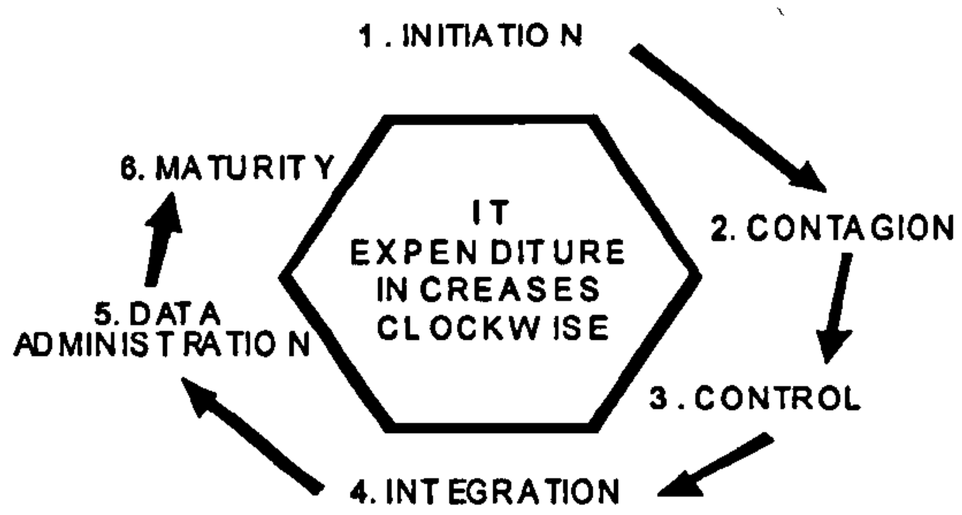


Figure 2-4 Nolan's model of the evolution of the IT/IS function
Source: Nolan (1979)

2.11 ISs in Banking Sector

The presence of an IS in each bank is essential, where the IS helps banks to obtain historical, current and future information which is pertinent to internal and external banks' activities in a timely and accurate manner, so that management at all levels can make decisions that achieve the objectives of the bank. ISs in banking sector are designed to support management in banking planning operations and make the best prospective plans to achieve the goals of the bank. This case is needed to provide a data and information base to help management to make its daily decisions at various levels. Moreover, these systems increase the accuracy and speed of performance of banking operations to provide better services to customers. They also provide greater precision in internal control of daily operations and help achieve immediate control of the results of these operations.

The importance of an integrated IS is due to the following: - (Almighrawi, 2004)

- The continued increase in quality and volume of the daily banking operations in banks, which increases the importance of the integrated IS to identify the most important customers in terms of the size of the daily operations and its increase and the rate of this increase. In addition, the importance of control processes for this volume of accounts and the daily operations which are carried out and the control of the treasury and accounts prior to the ending of daily business. All this needs to be done at the required speed and in an accurate and timely manner.

- The emancipation of the banks in their dealings and their emancipation from some restrictions and guidelines that were imposed by central banks and other regulatory agencies leading to an increase in competition between theses banks. Therefore, there arose the necessity of dealing through strong ISs that can provide necessary information to the bank in a timely manner.
- The need to consider the bank as one unit, and to deal with the client as one business package for all of his/her dealings with the bank (credit current accounts, debit current accounts, loans, deposits and transaction of Visa or MasterCard).
- The fact that banking retail operations vary according to the size of the various commissions which are received by the bank from the customer. In addition, the proceeds result from customer transactions, customer balances in the bank and the volume of his/her daily operations, and also the extent of the customer's contribution to develop activities and profits of the bank.
- Given the large volume of daily transactions and huge number of customers, this data can only be obtained using an integrated and accurate IS.
- Assistance to study innovation and adoption of new banking activities according to processes that take place and wishes of the customers. Moreover, prioritisation of existing activities and new banking activities those are proposed and necessary feasibility studies.
- It is easy to identify customer requirements and daily changes that occur and the necessary procedures to maintain current customers and attract new customers to the bank.
- It is possible to accomplish comprehensive marketing studies on current clients and prospective clients in respect of new banking activities, such as mobile banking services and periodic payment of customers' invoices (telephone bills, electricity bills, etc).

2.12 Concept of AISs

Generally, the ISs are based on two components, named, people and technical information. These work jointly in order to provide–necessary information to the organisation that enables it to carry out its business and achieve its objectives. Romney and Steinbart (2009) defined the AIS as follows: "a system that collects, records, stores,

and processes data to produce information for decision makers" (p.29). This definition illustrated in figure 2-5. They also said that AISs consist of six components: people, procedures and instructions, data, software, IT infrastructure and internal control and security measures. These components enable the AIS to accomplish following important business functions (Romney and Steinbart, 2009) as follows:

> "Collect and stores data about organisational activities, resources and personnel; Transform data into information that is useful for making decisions so management can plan, execute and control activities and evaluate activities, resources and personnel; and provide adequate controls to safeguard the organisation's assets including its data, to insure that the assets and data are available when needed and the data are accurate and reliable" (p.29).

These functions are discussed in detail in following sections.

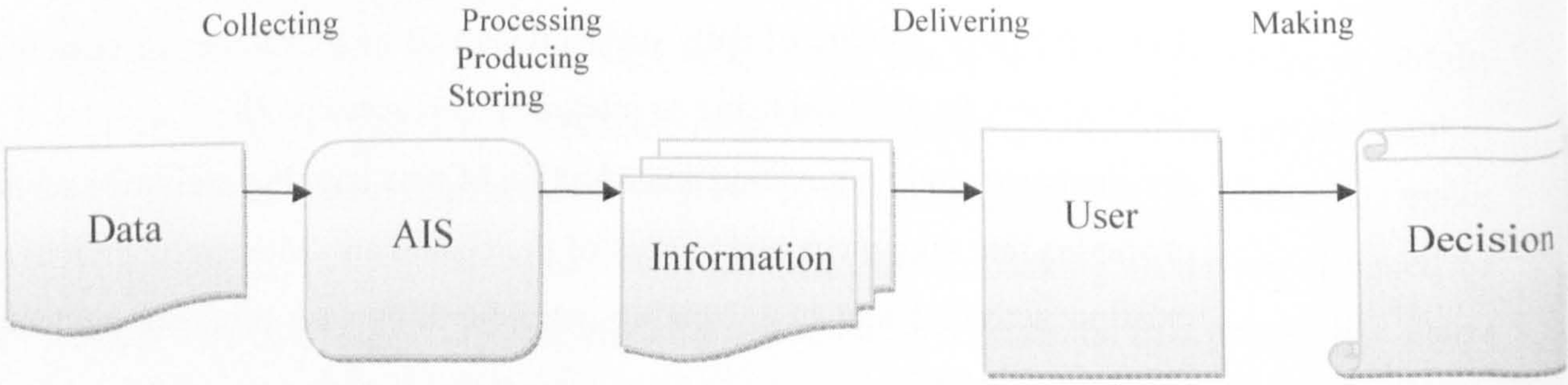


Figure 2-5 AIS data to produce information for decision maker

- **Data Collection and Storage**

The general supposition is that good decision-making is reliant on good data. Beynon-Davies (2002) suggested that some possible features of good data are: - it has a suitable level of accuracy, it completely covers the domain, and it is also current, accessible, summarised to an appropriate level of aggregation and relevant to the decision to be made. There can be hundreds or even thousands of transactions in each day that a business operates. These transactions are with customers and vendors, and can also be internally within the company. Every transaction generates data that must be processed to fill customer orders and purchase inventory and supplies. At the beginning to be a distinction between data and information, Turner et al., (2009) defined data and information as follows: "Data are the set of facts collected from transactions, whereas Information is the

interpretation of data that have been processed" (p.526). The most important principle in any system is that information must be put into and stored in the computer before it can be used and reported. The information which is input to the computer is stored in files. A file on a computer is conceptually similar to a file in filing cabinet. File design is one of the most important aspects, and therefore one of the first stages, of system design. The data collected in any transaction must be stored for many reasons. Turner et al., (2009) summarised the main reasons to store transactions data as follows:

1. To complete transactions from beginning to end. For example, a sale, this involve taking the order, pulling items from the warehouse, shipping items, billing the customer, collecting the cash, and creating the customer account for payment.
2. To follow up with customer or vendors and to expedite future transactions. For instance, if the company stores name, address, and details about customer, it need not re-enter that data when the customer places future orders.
3. To create accounting reports and financial statements, it would be possible for the system to provide information about revenues, expenses, assets, and liabilities for any accounting period.
4. To provide feedback to management so they can effectively and efficiently manage.

- **Data Processing**

In transaction processing systems, transactions are processed either in batches or one at a time. Batch processing occurs when similar transactions are grouped into a batch and that batch is processed as a group. An example of batch processing is processing payroll checks. The resulting pay checks are processed and printed in a group, or batch. Accounts payable and accounts receivable transactions are often processed in batches. For instance, payments to vendors are often processed in batches. Real-time processing occurs when transactions are processed as soon as they are entered. When determining whether batch or real-time processing is appropriate, Turner et al., (2009) said that system professionals must consider response time, efficiency, complexity, control, and storage media. Batch systems have slow response time because the transactions are not processed until the whole group is ready to be processed. Batch processing is more efficient than real-time processing for a large number of similar transactions. Real-time systems have fast

response times because the transactions are processed as entered. Real-time system is more complex because of the interactive nature of processing. However, Batch system is much simpler than real-time system. Moreover, control is easier to maintain in batch systems. Because in real-time systems there are no groups of transactions for which totals can be derived. Finally, batch system can use either sequential or random access storage, comparatively with real-time systems; data must be stored on random access.

2.13 Types of AIS

There are many different types of AISs used in business organisations. The type of system depends on the size of the organisation, the nature of its process, the extent of computerisation, and the philosophy of management. Turner et al., (2009) have divided the systems in place into three categories, as follows:

- **Manual Systems**

Currently, most large and medium-size organisation use computerised AIS rather than manual record-keeping systems. In addition, it may still have parts of their processes that involve manual records. On other hand, there are many small organisations that use manual systems, in whole or in part, to maintain accounting records. Because small organisations often use manual record keeping systems to examine manual processes in AIS. An entirely manual system would require source documents and paper-based ledgers and journals. As AISs became computerised, the manual processes of record keeping and posting were transferred to automated systems, which maintain the same structure of subsidiary ledgers and general ledger accounts but automated ledgers are computer files rather than paper records.

When IT is part of the AIS, that it is important to understand that the hardware and software are not entire AIS. The hardware and software as well as the human process, records, and process information are an integral part. The established process of entering the order is part of the AIS because it is part of business process that captures accounting data.

- **Legacy Systems**

Traditional accounting software systems are often called legacy systems. It is an existing system in operation within an organisation. A legacy system uses older technology in which the organisation has a considerable investment and that might be entrenched in the

organisation. Usually, legacy systems are based on old or inadequate technology. In addition, legacy systems may have served companies very well over many periods. Turner et al., (2009) said that, in 2002, an estimate by systems professionals indicated that at least 80% of organisations had legacy systems that they were attempting to maintain. Often, organisations are faced with the decision whether to replace or update legacy systems. When the benefits outweigh the cost, organisations typically decide to replace legacy systems.

- **Modern, Integrated Systems**

Nowadays, AIS environment, many accounting software systems are available for purchase that integrates many or all of the business process. Organisations also frequently purchase software rather than develop it internally. Usually, to meet specific needs of the organisation, the IT staff modifies purchased systems. According to Turner et al., (2009) there are many advantages to purchasing accounting software rather than developing software in-house as follows:

- Purchased software has a lower cost, because the development cost can be spread across the many organisations that purchase the software, rather than being absorbed completely by company that developed the software.
- Purchased software has shorter implementation time, because it is no longer necessary for the organisations to design and program their own accounting systems.
- This software system has fewer bugs, because they are not sold until they are fully developed, tested, and proven reliable.

2.14 Users of AISs

The modern business organisation served by the AIS is a very complex institution. The activities of prominent organisations are of interest to many users - customers, suppliers, employees, lenders, stockholders, and the various governments under whose jurisdiction they operate (Cushing et al., 1987).

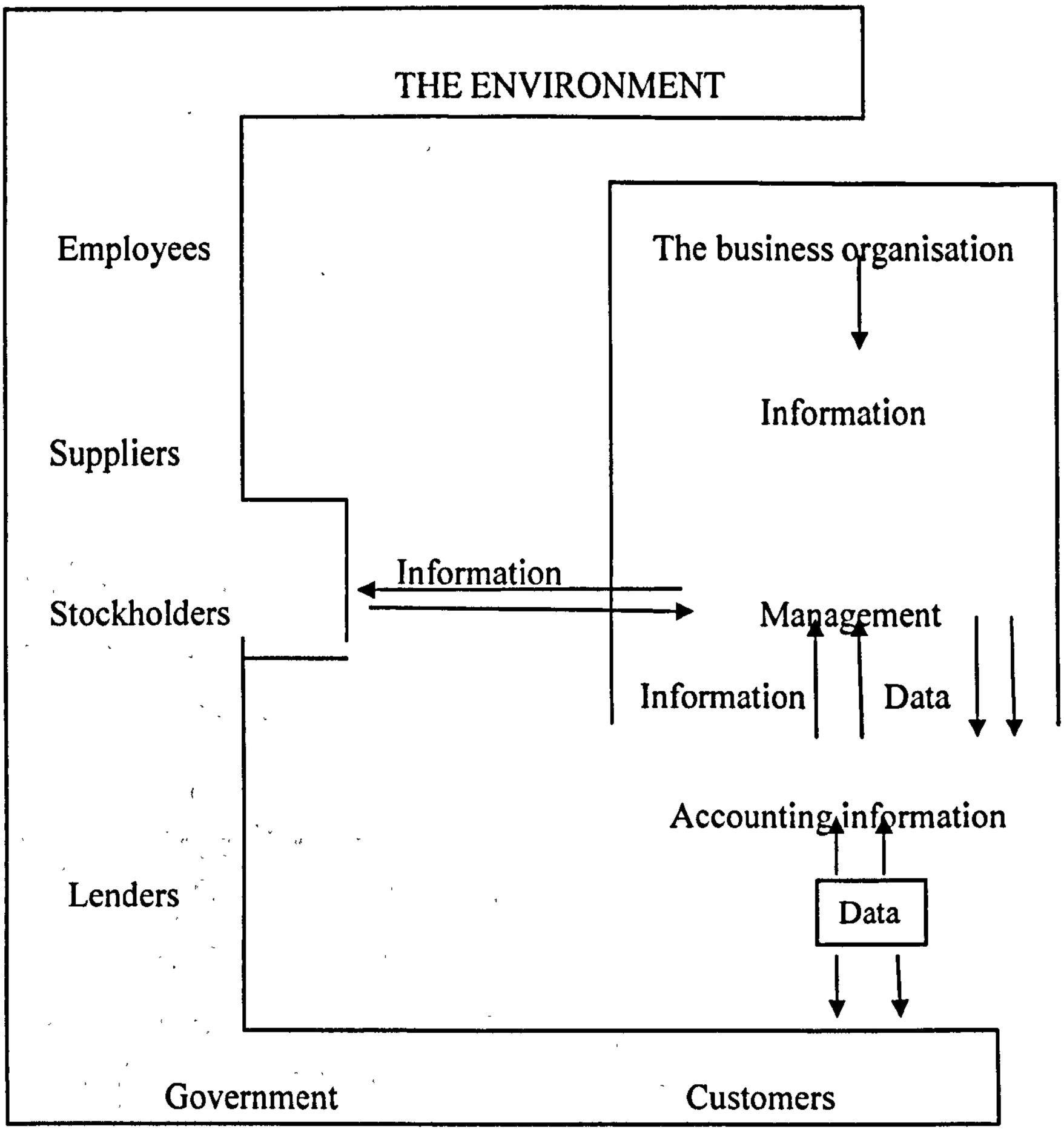


Figure 2-6 The relationship of the AIS to the business organisation and to the environment

Source; Cushing et al., 1987

The main role of AIS stems from its two major components: financial accounting and management accounting. Financial accounting provides required information to users outside an organisation. External accounting information users such as, current and prospective investors, creditors and governmental bodies. Preparing financial statements such as the balance sheet, the income statement and the cash flow statement produces this information. The six major external interest groups that receive information from the business organisations, as portrayed in Figure 2-6, are customers, suppliers, stockholders, employees, lenders, and government. The information, each group receives, includes both information for decision-making and routine data concerning the execution of

transactions. For the most part the information supplied to external users is either "mandatory" or "essential" (Cushing et al., 1987).

Cushing et al., (1987) argued that the area of internal information presents a much greater challenge to those who design AISs than the external reporting area. They suggest that:

> "In meeting mandatory and essential information requirements, the primary consideration is to minimise costs while meeting minimum standards of reliability and usefulness. When the reporting of information is discretionary, the primary consideration is that the benefit obtained from each report exceeded the cost of supplying it. Much of the challenge in designing an IS is due to the fact that it is often very difficult to measure the benefit derived from reporting a given set of information"(p.10).

2.15 Computerised AISs

Every aspect of accounting has been fundamentally changed by IT such as financial reporting, managerial accounting, tax and auditing. Because bookkeeping is mostly carried out by computer, management accounting concentrates on the design of systems, the development of budgets and the recommendation of future managerial actions in a variety of operational areas (Moscove et al., 2002). Computers also affect auditors due to increasing reliance on generalised audit software and other computer-assisted auditing techniques. Furthermore, traditional accounting firms, whose revenues used to be largely earned by audit and tax work, are now doing other activities. These include helping clients' design and implement computerised AIS, assessing the risk associated with computerised systems, and designing controls for such systems. As a result, AIS have become critical in the successful business of today in both of its components (financial accounting and managerial accounting) because AIS are involved in providing individuals and groups both within and outside the organisation with relevant information for decision making. With AIS there is a dramatic shift to the value of information that is produced and the importance of information to an organisation; an understanding of accounting as an IS has become vital. While the effects of computerisation are obvious on accounting systems, AIS is concerned with more than just computers.

However, computer technology is important to AISs and to accountants for many reasons (Moscove et al. 2002): (1) Computer technology must be compatible, and support the

other components of AIS; (2) It is no longer possible for auditors to treat a computer as black box, and audit around it. Rather, they now commonly audit through the computer. Auditors must evaluate computerised systems and must understand automation and automated controls, and also be knowledgeable about their strengths and weaknesses; and (3) Computer technology is inevitably going to affect the way in which future accountants will work.

2.16 AIS in Commercial Banks

The AIS is one of the most important and the largest ISs in a banking organisation. This importance stems from the nature of the financial operations of this sector, and the presence of the risk element in these operations (Almighrawi, 2004). Moreover, the availability of components of speed and accuracy are required in the preparation of information. In addition, the importance of the AIS in the banking sector is due to its role as an intermediary between savers and investors, also to its strong relationship with other economic activities. Thus, the financial services which are offered by the banking sector depend on the confidence that clients have in the responsibility of commercial banks. This confidence has resulted in an increase in the importance of the role of the accounting system to provide trustworthy information to savers and investors. This information should be able to reflect the main indicators used, to judge the soundness of the financial situation of the banks, which are the profitability and liquidity, ability to pay its liabilities, and the risks that are incurred by the provision of financial services.

Usually, commercial banking activity is controlled and supervised by the state, to protect the funds of depositors, in particular, and the national economy in general. The laws of control and supervision of the banking sector authorise the authorities of the central banks to perform tasks that relate to supervision and control of commercial banks. These tasks include the right of the central bank to create a set of general rules regarding establishment and organisation of banking supervision management. Furthermore, they also include the method that is to be followed in the evaluation of the assets of the banks, the ratio that should be taken into account when granting loans, the rate of interest, and the information that should be disseminated to the public and how.

As a result, the financial statements of the commercial banks have a special significance for several reasons, including the following: The nature of banking business as a kind of

important financial intermediary for the public; The necessity to meet the information required by the central bank for the purpose of the supervision of banks; and The pluralism of the financial statements and its appendices require explanations, comments and observations of its elements (Shehata, 1995).

For the commercial bank to be able to meet its above-mentioned obligations, the factors of speed and accuracy should be available during the preparation and processing of data and information. These factors are among the basic elements that the accounting system at the commercial bank should be based on. To achieve this, the system should be characterised by the following (Osman, 1994):-

- The ability to provide the management of the bank and the supervisory authorities of the banks the necessary information in a timely manner to formulate various policies. This information must include a number of details, in particular the following:-
- Analysis of bank assets, according to the ability of the bank to convert its assets to cash quickly and easily.
- Analysis of deposit accounts, according to depository sources (individuals, firms, government agencies). Accounts should also make clear the nature of the bank's other obligations (liabilities).
- Analysis of various accounts of reserves to determine the purpose of the retention of these reserves.
- Analysis of revenues, according to its resources.
- Analysis of expenses, according to various departments of the bank and dividing them according to their nature.

This information helps to prepare the statement of income and expenses for each department.

- The availability of an elaborate system for internal control that depends on the method of the operation system. In general, the general ledger must enclose a required number of general accounts to which achieve maximum control.
- The ability to provide the information requested by the various supervisory authorities, without the need to make an extra effort to provide this information.

- The ability to provide the necessary information to prepare tax declarations, not only the declaration of business, but also including other types of taxes that are collected by the bank on behalf of the state treasury department.

2.17 The Development of Accounting Systems in Commercial Banks

Accounting has the ability to keep pace with development and changes in the surrounding environment. Accounting is a science as any science, which has capabilities that enable it, to develop in response to the changes of economic, political and other variables (Almighrawi, 2004). Moreover, the development of accounting in its two aspects scientific and practical based on competences and fundamentals make it an effective system for measurement and disclosure. In other words, an effective system of information has the confidence of various categories in society. In addition, an accounting system is relied on to make decisions more effectively.

The rapid and successive changes in the international community in the last few years that have come to be called globalisation have had substantial and significant repercussions on the structure of local and international business. Organisations have changed their structures and strategies in response to the changes in the surrounding environment. Accountants have confronted difficult challenges, which are imposed by the characteristics of the globalisation. Therefore, it is necessary for accountants to develop their functions to adapt to the new situations, and also to meet the information needs of different categories by faster method and by non-traditional means.

Furthermore, the using dramatic developments in information technology, the direct impact of globalisation, such as the internationalisation of capital markets and the General Agreement on Trade and Services (GATS), and the increase in competition between banks and financial institutions has important impacts on the accounting function in general, and the role of accounting systems in commercial banks in particular (Almighrawi, 2004), that will be addressed in following section.

2.18 Electronic Commerce and its Benefits

There are several definitions of e-commerce. However, Turner and et al., (2009) said that "most would agree that e-commerce is a transaction between a business and customer, in which the transaction information is exchanged electronically. Under such a broad definition, there are many forms of exchange that could be called e-commerce" (p.569).

The use of credit card at a department store, ATM transactions with a bank, transactions of electronic data interchange (EDI) between vendor and buyer, and web-based transactions all fit into this definition of e-commerce. In addition, there are many benefits of e-commerce to the business and the customer. Bothe parties benefit from the increased access to the market, the speed and convenience of e-commerce, and the ability to share information.

However, there are several negative effects of the internet on business organisation, which were summarised by Laudon and Laudon (2006) as follows:

1 Enables new substitutes to emerge with new approaches to meeting needs and performing functions.
2 Availability of global price and product information shifts bargaining power to customers.
3 Procurement over the internet tends to raise bargaining power over suppliers; suppliers can benefit from reduced barriers to entry and from the elimination of distributors and other intermediaries standing between them and their users.
4 The internet reduces barriers to entry, such as the need for a sales force, access to channels, and physical assets; it provides a technology for driving business processes that makes other things easier to do.
5 Widens the geographic market, increasing the number of competitors, and reducing differences among competitors; makes it more difficult to sustain operational advantages; puts pressure to compete on price.

2.19 Specifications of the Integrated Accounting System

Almighrawi (2004) claims that the accounting system of commercial banks is an integrated system, if it includes the following points:-

- The system covers and connects all sub-systems of financial accounting of all activities and services, which are provided by the bank.
- The system connects the financial accounts with cost accounts and the estimated budget.
- The system has complete flexibility to add new banking services.
- The system is able to carry out adjusting entries and closing entries as well as preparing of financial statements.

- The system is able to prepare daily trial balances for each branch and for the whole bank.
- The system provides various reports according to revenue centres, cost centres, responsibility centres as needed (required).
- The system works as one integrated unit, and each sub-system can work alone.
- The system enables users to add new accounts to the accounts directory, and enables users to modify, delete, and reclassify it as needed.
- The system allows dealing with more than one currency.
- The system rules the control on entered data, and prints compulsory reports about the entered entries and its adjustments.
- The system allows adding another sub-system as needed.
- The system contains effective self-censorship that prevents access to accounts for non-specialists, and ensures the correctness of the transaction.
- The system allows using the local area network (LAN).
- The system allows preparing accounting and statistical reports at any time.
- The system contains a list of guiding instructions, which appear on the screen and guide the operator of the computer.
- The system is compatible with different kinds of computers and printers.
- The system can accommodate the Automatic Teller Machines (ATMs).
- The system allows for positive interaction with the society for worldwide interbank financial telecommunication system (SWIFT).
- The system allows for positive interaction with customers through the internet.
- The system allows for dealing with the automated clearing house (ACH).
- The system allows for dealing with the modern credit cards.
- The system allows basically using the local language and the English language as a second language.

2.20 Libya and Libyan Economic Development

This section presents a brief description of a general background on Libya, Libyan economic characteristics, Libyan banking sector, Libyan foreign trade, Libyan economic reforms and finally, Libyan privatisation programmes.

Libya's official name is the Socialist People's Libyan Arab Jamahiriya, and its capital is Tripoli. Libya is located in North Africa; it is between Egypt and Tunisia bordering the Mediterranean Sea. It covers about 1,759,500 square kilometres (678,400 square miles). Libya is slightly larger than Alaska. The coastline of Libya is about 1,770 kilometres long. However, the vast majority of the land of Libya is desert. Also Libya has borders in the south with Chad, Niger and Sudan, in the west with Tunisia and Algeria, and in the east with Egypt.

The climate in Libya is Mediterranean along the coast with a dry extreme desert interior.

According to the latest official census in 2006, the population was approximately 6 million in 2006 and the population average growth rate is 2.02%. The majority of the population lives in or around the coastal cities, particularly in Tripoli and Benghazi. Life expectancy for the total population is 76, for males 74 and for females 79. Arabs and Berbers represent 97% of the overall population and others 3%. In addition, 97% of the population is Sunni Muslim and other religions represent 3%. Libyan people speak Arabic; English and Italian are widely understood in cities. 82% of the total population is literate, 92% of males, 72% of females.

Historically, the Berbers originally settled Libya, but Arabs invaded the territory in AD 642, bringing Islam to the region. Arabs ruled the territory now called Libya until the 1500's when it was invaded and controlled by many foreign occupiers - the Ottoman Empire occupation (1551-1911) and European (Italian/ French/ British) occupations (1911-1951). Italy occupied the country following the First World War. Italy generated a new administrative system, where the country was divided into three main regions. These regions were known as, Cyrenaica in the East, Tripoli in the West and Fezzan in the South. During the Second World War, the best route for gaining independence as perceived by many locals (Libyans) was to fight with the British army. After the defeat of Italy, there came the period of British and French administration (1943-1951), (Division, 2005).

On the 24th of December 1951, the United Kingdom of Libya was proclaimed as an independent state made up of the Fezzan, Tripolitania, and Cyrenaica provinces under the rule of King Idris I. The provinces had considerable autonomy until 1963 when their autonomy was abolished and the provinces placed under the control of the central government.

On 1st September 1969, military officers led by Col. Moamar al Gaddafi overthrew the King and took control of the country. A new government was formed and the state called the Libyan

Arab Republic was established. In 1977 the official name of the country changed to "The Great Socialist People's Libyan Arab Jamahiriya" (Saleh, 2001).

2.20.1 Libyan Economic Characteristics

Economic and political considerations are the primary influence and the major determinants of the investment climate. A country's level of development, the state of the balance of payments, inflation rates and currency stability are very important factors in the investment climate. Infrastructure facilities, international transportation and communication networks are vital influences on the investment climate as well.

The United Nations Development Programme (UNDP), in its Human Development Report, classified Libya as a highly-developed country, ranked 56th out of 177 countries in the human development report (UNDP, 2007/2008), compared with Human Development Report (2006), which classified Libya as a medium-developed country, ranked 64st out of 177 (UNDP, 2008 and 2006).

Table 2-3 illustrates key Libyan Economic Indicators in the years between 2005 and 2008. During 2008 the economic activities recorded a modest improvement, though the achieved growth rate, which was 6.1%, compared with 5.9%, 9.9% and 5.6% in 2005, 2006 and 2007 respectively. In 2008 the Gross Domestic Product (GDP) at Constant Prices (2003) was LYD 51.7 billion, compared to LYD 48.7 billion in 2007. This increase is due to the growth of non-oil economic sectors by 7.2%, whereas the oil sector and related activities grew by 5.2%. In the non-oil economic sector there was particular growth in the construction and housing sector, which grew by 21%. This is due to a recent architectural renaissance and the housing loans granted by the Saving and Real-Estate Investment Bank. The sector of electricity, gas and water also experienced growth, as did the sector of banks and insurance and the sector of transport and communication, which grew by 10%, 5% and 9% respectively. Regarding the extent of the contribution of economic activities to the gross domestic product (GDP), table2-4 shows that the activities of oil and natural gas and related activities contributed 52.5% and non-oil activities contributed 47.5% of the total real product.

Due to the increase in the rates of economic growth in 2008, Gross Domestic Product (GDP) per capita increased from LYD 8970 in 2007 to LYD 9332 in 2008 (see Table 2-5).

Table 2-3 Libya Real Gross Domestic Products by Sector (M. LYD*)

Economic Activities	2005	2006	2007	2008	Growth Rate %
Agriculture, Forestry & Fishing	1502.1	1649.8	1715.8	1749.7	2.0
Oil,& Natural Gas	22922.7	23912.5	24321.7	25586.4	5.2
Mining, Quarrying & Manufacturing Industry	1404.5	1468.3	1493.5	1571.1	5.2
Construction & Housing	2290.7	2462.5	3078.2	3724.6	21.0
Trade, Restaurant & Hotels	2460.1	2657.7	2960.8	3199.8	8.1
Transport& Communication	2475.8	2786.6	3130.1	3411.8	9.0
Banks & Insurance	676.7	748.6	843.5	885.6	5.0
Electricity, Gas and Water	924.2	1001.7	1140.7	1254.7	10.0
Other Services	8904.8	9444.3	10025	10304.2	2.8
Total GDP	**43561.6**	**46132.0**	**48709.3**	**51687.9**	**6.1**
Oil sector and related activities	24327.2	25380.8	25815.2	27157.5	5.2
Non-Oil economic sectors	19234.4	20751.2	22894.1	24530.4	7.2

Source: Central Bank of Libya (the annual report, 2008). *In 2007 1 LYD = $ 0.82 = £ 0.41

Table 2-4 Libya Gross Domestic Products (GDP) by Sector (%)

Economic Activities	2005	2006	2007	2008
Oil,& Natural Gas and related activities	55.8	55.0	53.0	52.5
Non-Oil economic sectors	44.2	45.0	47.0	47.5
Total GDP	100	100	100	100

Source: Central Bank of Libya (the annual report, 2008)

Table 2-5 Real GDP per capita

Years	Total GDP (M.LYD)*	Population (In Thousands)	Per capita income (LYD)*
2005	43561.6	5300	8219
2006	46132.0	5324	8665
2007	48709.3	5430	8970
2008	51687.9	5539	9332

Source: Central Bank of Libya (the annual report, 2008).
*In 2008 LYD 1= $ 0.80 = £ 0.55

2.20.2 Libyan Banking Sector

This historical subject can be divided into two periods of time. Each period is distinguished by a manifestation of the evolution of banking activity in the country and each possesses characteristics particular to the period.

- **The banks during the period from 1952 to 1969**

In the period after the Second World War and after the independence of Libya in 1951, foreign banks such as Barclays Bank and Bank of Rome continued to provide their

services during the British and French military administrations. Moreover, during the period from 1952 to 1969, the following banks were established (Abdolmalik, 2005).

- British Bank for the Middle East in 1952.
- Limited Arab Bank in 1952.
- Bank of Egypt in1953.
- National Bank of Libya in 1953.

The National Bank of Libya was established on 26 April 1955, and began its business by opening its main centre in Tripoli in 1956, and in 1957 opened a branch in Benghazi and another in Sebha. In addition, it began carrying out its business by organising and issuing banknotes and coins, and engaged in commercial business departments, as any commercial bank. In 1958 the banking legislation No 4 was issued. Accordingly the Central Bank of Libya superseded the Libyan National Bank. It was awarded many powers; the most important of them is supervision over banks, making credit policy and supervising its implementation, maintenance of cash reserves and setting the interest rates and currency prices. In addition, the legislation encouraged the establishment of some Libyan Banks.

- **The banks during the period after 1969**

The banking sector in Libya before 01/09/69 consisted of the following banks:

A. Commercial Banks

1. Sahara Bank
2. Commercial bank
3. Al-Nahda Alarabia Bank
4. Bank of North Africa
5. African Banking Corporation
6. Barclays Bank
7. Bank of Rome
8. Al-Arabi Bank
9. Bank of Napoli

B. Specialised Banks

1. Libyan national agricultural bank
2. Libyan real estate industrial bank

One of the primary targets of the revolution was the Labialisation of the Libyan banking sector. Thus, on 13/11/1969 a decision was made to libyanise all foreign banks operating in the country. According to the resolution the branches of four foreign banks were transferred to 51% state-owned Libyan Banks and changed their names as follows:

- Gumhouria Bank instead of Barclays Bank
- Umma Bank instead of Bank of Rome
- Al-Orouba Bank instead of Al-Arabi Bank
- Al-Esteqlal Bank instead of Bank of Napoli

In 1970, law No. 153 was issued to nationalise foreign shares in commercial banks and reorganise them. This law resulted in 100% Libyan ownership of shares (as opposed to the 51% mentioned above).The previous commercial banks were merged in five major banks as follows:

1. National Commercial Bank.
2. Wahda Bank.
3. Gumhouria Bank.
4. Umma Bank.
5. Sahara Bank.

The issuance and implementation of these laws and resolutions resulted in the emergence of a national banking system composed of five commercial banks, under supervision and control of the central bank of Libya, which had become a central bank possessing tools of monetary policy and implementing them as appropriate, in the interests of national economy.

The law No. 1 of 1993 concerning banking, currency and credit was issued by the central bank of Libya. This law permitted the establishment of commercial banks, such as, Commerce & Development Bank in 1996, Mediterranean Bank in 1997 and Alejmaa Alarabi Bank in 2003. It also allowed foreign banks to open branches in Libya. Moreover, to implement the strategy adopted by the central bank of Libya to restructure, develop and modernise the Libyan banking sector, the board of director's of the Libyan central bank issued decisions No. 4 of 2007 and No. 8 of 2008. As a result, Umma Bank and Gumhouria Bank were merged in one bank under the name Gumhouria Bank. This merger appeared as a unified Libyan bank with total assets of more than 25 billion Libyan

Dinars, and 146 branches and agencies and 5800 employees. Thus, it will be the second largest Libyan bank after the External Libyan Bank. It will also be among the top ten banks in North Africa according to the size of total assets.

2.20.2.1 Operating Banks in Libya

1) Central Bank of Libya (CBL)

As previously said, the central bank of Libya was established on 26/04/1955. The bank opened its main centre in Tripoli in 1956, and then opened a branch in Benghazi in 1957 and another branch in Sebha. The bank began banking business as s government bank and its function was limited to organizing issuance of cash and currency. Owing to the absence of Libyan commercial banks at that time, the law allowed the bank to practice normal commercial banking business. The functions of the central bank have developed since the issuance of law No.30 of 1955 to establish the bank until the issuance of law No1. Of 2005, that dictated in the fifth article the following tasks:-

- Issuance of Libyan monetary currency and to maintain its stability.
- Management of state's reserves of gold and foreign exchange.
- Organization of monetary policy and supervising operations of currency conversion in Libya and abroad.
- Organization of credit and banking policy and supervision of its implementation in public policy of the state.
- Cash management in the national economy.
- Organization of foreign exchange market and supervision.
- Provide advice to the state in matters of economic policy.

These tasks obviously impacted on evaluation of the central bank of Libya, as can be seen in table 2-6, where total assets of the bank rose from about 58.4 billion Libyan dinars at the end of 2005 to about 83.7 billion Libyan Dinars at the end of 2006 to about 106.4 billion Libyan dinars at the end of 2007 to about 126.4 billion Libyan dinars at the end of 2008; and at the end of 31/12/2009 it was about 136.281 billion Libyan dinars. Also the capital of the CBL is 500 million Libyan dinars.

Table 2-6 Assets of Central Bank of Libya (Billion LYD)

The years	Total Assets	Increase amount	Increase percent
31/12/2005	58.417	-	-
31/12/2006	83.682	25.265	43.2%
31/12/2007	106.405	22.723	27.2%
31/12/2008	126.395	19.990	18.8%
31/12/2009	136.281	9.886	7.82%

Source: CBL, annual reports 2006, 2007, 2008 and http://cbl.gov.ly/pdf/00MI833PMUHYTiyX8u4.pdf

Operational structure of the bank includes the following departments:-

- Issue Department.
- Reserve Dept.
- Banking Operation Dept.
- Accounting and Investment Dept.
- Research and Statistics Dept.
- Monetary and Banking Supervision Dept.
- Administrative and Personal affairs.
- Auditing Dept.
- Legal Bureau Dept.
- Computer Centre.
- Institute of Banking and Financial Studies.
- Banking Training Centre.

- **Banking Developments**

Recently the central bank of Libya made efforts to raise the ability of commercial banks and their contribution in economic activity, which adopted a strategy based on three dimensions (CBL, Annul report,2007) :-

1. Development and modernisation of banking and financial sector, through development and implementation of many strategies to develop an environment of financial services.
2. Restructuring of commercial banks, through development and implementation of a comprehensive transformation program to and improve current performance of state commercial banks.
3. Gradual opening up to foreign enterprises, where 19% of shares of Sahara Bank were sold to French BNP Paribas bank.

In order to implement this strategy, the board of directors of the CBL issued a series of decisions related to the banking sector, the most important of these decisions being the following:-

- Liberalization of debit interest rates.
- Sale of shares owned by the CBL in capital of Sahara Bank and Wahda Bank.
- Authorization to merge Umma Bank in Gumhouria Bank.
- Permission for foreign banks to open representative offices in Libya.
- Establishment of Libyan Banks Union and issuance of its basic regulation.

▪ **Exchange Rate Policy**

The national economy during the past two decades faced many problems and economic and financial difficulties, which were a reflection of conditions and changes to the international monetary and economic environment. This necessitated adopting a new set of policies and economic procedures. One of these policies was the exchange rate policy. The following is a brief review of evolution of the exchange rate policy followed by the CBL from its inception until the present time.

LYD was issued as a national currency for the first time under the name of pound at the beginning of 1952. Its value was equal to pound sterling, and each of them was equivalent to 2.8 US Dollars. In November 1971 the United States reduced the value of the dollar, which led to a rise in the value of the LYD against the dollar to 1 LYD = 3.04 USD instead of 1 LYD = 2.8 USD. In February 1973, the USD was devaluated for the second time by 10%, resulting a rise of the LYD against the USD by 11% to 1 LYD = 3.3776 USD instead of 1 LYD = 3.04 USD. In the same year (1973), the LYD was pegged to the USD at a fixed exchange rate of 1 USD = 0.2968 LYD. As a result, the value of the LYD against other currencies changed depending on the change in the value of the USD against those currencies.

The LYD maintained this value at this level until the end of 1986, which helped stability of the value of the LYD against the USD and other foreign currencies. In March 1986, the link of the LYD and USD was disengaged and linked to the Special Drawing Rights Unit (SDRs) with an exchange rate equivalent to 2.8 SDR per 1 LYD. This unit was expanded several times. During the period from 1999 to 2001 there was a gradual reduction in the value of the LYD against the USD from 3.54 dollars per dinar at the end of 1990 to 1.55

dollars per dinar at the end of 2001. In the 2002, the LYD's exchange rate stood at 0.608 SDR, or the equivalent of 1 dinar = 1.3 dollars, i.e., a 50% reduction of its value at the 2001. In June 2003 the LYD's exchange rate was reduced by 15 % to 0.5175 SDR. The following table (2-7) shows the evolution of exchange rates of some currencies versus the LYD during the period 2002 – 2009.

Table 2-7 Exchange rate of Libyan Dinar against major international currencies

Currencies / End of	Sterling	US Dollar	Euro	Swiss Frank
2002	0.51478	0.82395	0.79059	1.20272
2003	0.43144	0.76621	0.61316	0.95623
2004	0.41703	0.80158	0.58905	0.91003
2005	0.42954	0.73963	0.62696	0.97209
2006	0.39682	0.77821	0.59139	0.94926
2007	0.40846	0.81684	0.55598	0.92214
2008	0.55117	0.79897	0.56673	0.84331
2009	0.50865	0.80632	0.56233	0.83759

Source: CBL, annual reports 2006, 2007, 2008, economic bulletin 31/12/2009 and http://www.cbl.gov.ly/xrates.php

- **Banking Training**

The CBL and commercial banks make efforts to create banking cadres to be able to keep pace with developments in the field of banking work. In addition, to use a modern technology that contributes to increase productivity and raise efficiency of the banking sector and provide better services by less costs and efforts as well.

Therefore, the Institute of Banking and Financial Studies organised 96 training programs in 2007 and 194 programs in 2008, which included specialised courses, seminars, meetings in the field of banking work and assistance programs in the English Language and computers. In total, 4115 and 5180 trainees in 2007 and 2008 respectively of employees in the banking sector have attended these programs. Moreover, the institute has a plan which is being implemented to ensure that cadres are qualified and trained in various aspects of a modern banking business. It is also implementing standards of international banking work, modern techniques and studying of the English language (CBL, Annul report, 2007and 2008).

▪ National Payment System

The payment systems have witnessed important developments in recent years. They have become heavily dependent on more sophisticated applications, a matter that allowed for the development of electronic smart means that contribute to diversification, acceleration and accuracy of various financial and banking services. In the context of the CBL, there is a trend toward increasing the benefits of the large developments of information technologies and improving the banking activity environment. The CBL and commercial banks jointly started implementing an ambitious program for technological developments in the area of information technology in the National Payment System. This program was preceded by approving a plan, set by a committee of experts in banking activities. This plan's objective is to formulate a strategy that ensures efficiency, effectiveness and safety for the developments of a national payment system to contribute to the development of financial and other economic sectors.

To execute this program, contracts with international companies were concluded to undertake the following projects:-

- **Real-Time Gross Settlement (RTGS)**

This system electronically, irrevocably, settles the accounts of banks and public institutions with the CBL at every working day-end. This settlement will be required of all practicing banks and financial institutions.

- **Automated Clearing House (ACH)**

Relates to the settlement of all transactions resulting for bank transactions with their clients, before going to Real-Time Gross Settlement for final settlement.

- **Automated Checks Processing (ACP)**

This system relates to electronic inter-banks clearing of checks according to a scanning technique, paper files and net-transaction posting to the clearing Automated Clearing House System in order to easily an safely settle the values of inter-bank checks.

- **Automated Teller Machines (ATM)/Points of Sales (POS)**

This system provides a fundamental environment for the national automated teller distributor that provides access to all customers' accounts with practicing banks and executes cash drawing transactions through automated teller machines by national and international networks. It also enables businessmen, their clients and companies that

provide these services to accomplish the payments for transaction charges electronically using points of sales, in addition to the execution of all generally accepted financial international electronic transactions.

- **Core Banking System**

This system aims to develop technologies and techniques for banking activities of national banks in a way that qualifies them to benefit mostly from the huge technologies provided by the project of National Payment System, and to strengthen the competitiveness with international banks. This system is being implemented over two stages, one for the CBL and the other for commercial banks participating in the project, using a technique that provides the applications while ensuring the acceptance of new participants in the system as necessary. These systems will be interlinked and linked with commercial banks with various communication means such as optic fibres, centimetre waves, satellites, wireless net, digital circuits and other communication means. The systems will be provided with coding and protection software in order to ensure safe and protected structure for data transmission between banks, the currently-under-construction data centres and all electronic financial services channels.

Banks are being prepared so that they may work with National Payments System. The project includes a training program aimed to train and up skill about 60% of employees in the CBL and commercial banks aimed at qualifying national professionals capable of managing and implementing all parts of the project. Three data centres will be established according to the state of the art. These centres will ensure online functioning of national banks all the time and in all circumstances. The appropriate networking of the main data centre, auxiliary and emergency centres will allow for their automatic alteration when necessary to avoid any interruption whatsoever the reasons. It will also ensure the flow of services on any weekdays. To make the system more effective, the Article no (5) of the Law no (1) of the year 2005, regarding banks, states that one of the capacities of the CBL is to supervise the National Payment System, including the interbank clearing transactions of banks subject to the provisions of this law, and established the regulations governing it. http://www.cbl.gov.ly/en/home/index.php?cid=70

Regarding the cost of the National Payment System project (NPS), it was LYD 67,393,084 on 30/06/2008 (1 LYD = £0. 43 in 30/06/2008). Table 2-8 shows the total cost

of the project until 30/06/2008 divided between CBL and Libyan commercial banks according to the agreement between banks.

Table 2-8 Total of National Payment System cost on 30/06/2008

Statement	Payments	CBL	Gumhouria Bank	Wahda Bank	Sahara Bank	National Commercial Bank	Natio Bank Corp
Supply and installation of RTGS, ACP, ATM, POS, CMS	**39,867,236**	17,940,256	7,973,447	3,986,723	3,986,723	3,986,723	1,993
Overseeing the development of the NPS	**5,278,307**	2,375,238	1,055,661	527,830	527,830	527,830	263,91
Consulting and legal services	**2,691,097**	1,210,994	538,219	269,109	269,109	269,109	134,55
Supply, installation and support of banking systems	**6,657,765**	3,328,882	1,479,503	739,751	–	739,751	369,87
The provision of databases	**2,324,589**	1,046,065	464,917	232,458	232,458	232,458	116,2
Supervision on the central banks' systems (CBS)	**1,666,060**	749,727	333,212	166,606	166,606	166,606	83,303
Advertisements and consultations expenses	**322,846**	143,958	65,008	32,502	32,502	32,502	16,361
Rewards and allowances	**4,806,291**	2,162,831	961,258	480,629	480,629	480,629	240,31
Computers	**1,123,853**	505,734	224,770	112,385	112,385	112,385	56,192
Training	**183,202**	82,441	36,640	18,320	18,320	18,320	9,160
Various expenses	**2,471,833**	1,112,324	494,366	247,183	247,183	247,183	123,59
Total	**67,393,084**	**30,658,454**	**13,627,007**	**6,813,503**	**6,073,752**	**6,813,503**	**3,406,8**

2) Commercial Banks

The activity of Libyan commercial banks is under control of the state, to protect funds of depositors in particular and protection of national economy in general. The CBL has a right to supervise and control on the commercial banks, for example, regarding the establishment and organization of management control the banks, the manner which is to be observed to evaluate assets of banks and the rules and ratios to be taken into account when granting loans credit facilities and interest rates. The following commercial banks are operating in Libya in 31/12/2008:-

1. Gumhouria Bank

The Gumhouria Bank is 100% in state ownership. It was established in 1969 as wholly owned by the Central Bank of Libya. It is located in Tripoli and has about 108 branches and 38 agencies around the country. It has become the largest bank in Libya after it merged with Umma Bank in 2007, where its capital is 200 million Libyan Dinars and its total assets more than 20.5 billion Libyan Dinars.

2. Sahara Bank

The Sahara Bank is 81% privet ownership and 19% BNP Paribas Bank ownership. It was established in 1964. It is located in Tripoli and has about 46 branches and 7 agencies around the country. Its capital is 126 million Libyan Dinars and its total assets were more than 11.7 billion Libyan Dinars.

After the completion of the Central Bank of Libya to sell its shares in the Sahara Bank, it was 82.7% of Sahara Bank capital. Therefore, the Sahara Bank was the first public sector institution that was fully privatized. (http://www.saharabank.com.ly/ar/Page.asp?ID=84).

3. National Commercial Bank

The National Commercial Bank is in 100% state ownership. It was established in 1970. It is located in Albayda. Its capital is 100 million Libyan Dinars and its total assets were nearly 7.5 billion Libyan.

4. Wahda Bank

The Wahda Bank is 54.1% state ownership, 26.9% privet sector and 19% the Arabic Bank ownership. It was established in 1970. It is located in Benghazi and has about 68 branches and 6 agencies around the country. Its capital is 108million Libyan Dinars, and its total assets were more than 5.5 billion Libyan Dinars. In addition, the Wahda Bank is 54.1% state ownership and 45.1% private sector.

5. Commerce and Development Bank

The Commerce and Development Bank was established in 1996. It is located in Benghazi and has 9 branches and 19 agencies around the country. Its capital is 50 million Libyan Dinars, and its total assets were more than 1.8 billion Libyan Dinars.

6. Alejmaa Alarabi Bank

The Alejmaa Alarabi bank is privet sector. It was established in 2003. It is located in Benghazi and has 3 branches and 4 agencies around the country. Its capital is 30 million Libyan Dinars, and its total assets were 328.4 million Libyan Dinars.

7. Aman Bank for Commerce and Investment

The Aman Bank for Commerce and Investment is privet sector. It was established in 2003. It is located in Tripoli and has 11 branches and agencies around the country. Its capital 10 is million Libyan Dinars, and its total assets were nearly 500 million Libyan Dinars.

8. National Banking Corporation

At the beginning of 1996, regional banks were established (Alahli Banks). The nature of its work was no different from any commercial banks operating in Libya, apart from its geographical location, and thus these banks were small in terms of their capital and their contribution to economic activity.

Until the end of 2005 the number of these banks was 48 banks, covering different regions of the country and under control and supervision of the central bank of Libya. Due to restructuring of these banks, in 2006 decisions were issued to merge these banks with each other or in National Banking Corporation, which has become a commercial bank. The National Banking Corporation is state ownership. It is located in Tripoli and has 29 branches and 2 agencies around the country. Its capital is nearly 55 million Libya Dinars and its total assets were more than 1.1 billion Libyan Dinars.

9. Mediterranean Bank

The Mediterranean Bank is in the private sector. It was established in 1997. It is located in Benghazi and has 5 branches. Its capital is 15 million Libyan Dinars, and its total assets were more than 100 million Libyan Dinars.

10. Alwafa Bank

The Alwafa Bank is privet sector. It was established in 2004. It is located in Tripoli and has 3 branches and 1 agency. Its capital is 5 million Libyan Dinars on 31/12/2005 and its total assets were nearly 180 million Libyan Dinars.

11. Alsaraya Trading and Development Bank

The Alsaraya Trading and Development Bank is privet sector. It was establishment in 1997. It is located in Tripoli. Its total assets were 91.6 million Libyan Dinars.

12. Arab Commercial Bank

The Arab Commercial Bank is privet sector. It was established in 2005. It is located in Tripoli, and its total assets were nearly 88 million Libyan Dinars.

13. United Bank for Trade and Investment

The United Bank for Trade and Investment is privet sector. It was established in 2007. It is located in Tripoli and has 4 branches and 6 agencies. Its capital is 22.65 million Libyan Dinars and its total assets were more than 160 million Libyan Dinars.

14. Alwaha Bank

The Alwaha Bank is branch of foreign Libyan bank. It was established in 2006. It is located in Tripoli, and its total assets were more than 600 million Libyan Dinars.

Table 2-9 Total assets by million LYD, Libyan Commercial Banks in 31/12/2008

The Bank	Total Assets	Ratio %	Initial study	Case Study
Gumhouria Bank	20600.1	40.9	√	
Sahara Bank	11713.5	23.3	√	
National Commercial Bank	7463.0	14.8	√	
Wahda Bank	5512.9	11.0	√	√
Commerce & Development Bank	1848.2	3.7	√	√
National Banking Corporation	1130.3	2.2	√	
Alwaha Bank	609.0	1.2	√	
Aman Bank for Commerce & Investment	484.6	1.0	√	
Alejmaa Alarabi Bank	328.4	0.7	√	√
Alwafa Bank	179.8	0.4		
United Bank for Trade and Investment	163.8	0.3		
Mediterranean Bank	102.7	0.2		
Alsaraya Trading and Development Bank	91.6	0.2		
Arab Commercial Bank	87.9	0.2		
Total	**50315.8**	**100**		

Source: CBL. The financial statements of commercial banks at the end of 2008.

2.20.3 Libyan Foreign Trade

The available data from the Libyan Central Bank indicates a growth in the volume of Libyan Foreign Trade (imports and exports) in 2007. Table 1-10 shows that in 2007, the rate of the volume of Libyan Foreign Trade grew by 11.7%, reaching LYD 49.5 billion, compared with LYD 44.3 and 39.1 billion in 2006 and 2005 respectively. This rise is due to the increase in exports by LYD 4.7 billion in 2007, reaching LYD 41.0 billion. Moreover, the increase in

crude oil prices in world markets and the increase in the quantity of exports has had a significant impact on increasing Libyan foreign trade.

Furthermore, the data of Libyan foreign trade refers to a continuing growth in total exports (oil and non-oil) in 2006 and 2007. However, oil exports represented 30.3, 34.9 and 39.6 billion LYD in 2005, 2006 and 2007 respectively. This represented increases of 97.3%, 96% and 96.6% of total exports in 2005, 2006 and 2007 respectively. This has had a significant effect on the increase in growth, and was a result of a noticeable rise in world oil prices.

These figures reveal a heavy dependence on crude oil for exports to generate receipts and Government revenue - about 96.6% of exports in 2007, compared with the export of non-oil, which was 3.4% of the total of export (see Table 2-10). This situation makes the Libyan economy more vulnerable to fluctuations in world oil markets, which are reflected in the overall social and economic variables in Libya.

The imports of machinery and transport equipment rose to a peak in 2007, accounting for nearly half of total imports (45.6%), response to general economic policy targets aimed at increasing growth.

Table 2-10 Trade Libyan Balance (in M. LYD*)

	2005	2006	2007
Exports & Re-exports	31,148	36,336	40.972
Oil Sector	30,300	34,900	39.579
Oil Sector (%)	97.3	96	96.6
Imports	7,954	7,935	8.501
Foreign trade volume	39,102	44,271	49.473
Trade Balance	23,194	28,401	32.471

Source: Central Bank of Libya (the annual report, 2008. *In 2008 LYD 1= $ .80 = £ .55

2.20.4 Libyan Economic Reforms

According to Ellabbar (2007) "the Libyan government introduced a series of reforms in order to restructure the economic sectors to allow expanding the base of ownership and allow the direct participation of the private sector in economic activities" (p.12).

From the beginning of the 1990's, the State issued a number of statutes, which regulated economic operations. This was started by its unification of the exchange rates. The next financially significant statute cancelled the requirement for Import and Export Licenses to allow individuals, corporate bodies and companies to practice economic activities (Ellabbar

2007). This statute led to an improvement in the role of banks in economic activities and increased the volume of the business operations and competition. For the purpose of catalysing and encouragement of trade and making the country a free trade area, Libya lifted all duties (except for cigarettes) in August 2005 and replaced them with Service Import Taxes which is 4% tax (Ellabbar, 2007). In more specific terms, the Secretariat of the General Peoples Congress (the Libyan Parliament) enacted, for example, the following Economic laws:

- Law 5, 1997 - Encouragement of Foreign Capital Investment (subsequently amended by Law 7, 2003);
- Law 9, 2000 - Regulation of Transit Commerce and Free Zones;
- Law 21, 2001 - Practice of Economic Activities for Individuals and Public Companies;
- Law 1, 2005 – Concerning Banking;
- Law 2, 2005 - Combating Money Laundering.

In addition, the General Peoples' Committee (the Libyan government) issued many Economic regulations, such as:

- GPC decision 178, 2001 - Organizing the work of agencies;
- GPC decision 2, 2002 - Organizing of Import and Export;
- GPC decision 21, 2002 - Organizing of Foreign Capital Investment;
- GPC decision 8, 2005 - Organizing the opening of representatives' offices for foreign companies in Libya;
- GPC decision 737, 2005 - Organizing arrangements of registration of branches and offices for representing foreign companies.

2.20.5 Libyan Privatisation Programmes

Privatisation is not a goal in itself, but it is a specific approach to encourage better results in terms of costs, quality and innovation; the idea behind it is to improve economic efficiency. As in most developing countries, privatisation is a much-debated subject in Libya. Until 1980, the development plan in the Libyan economy totally depended on the public sector in both industrial and services sectors. By the early 1980s the earnings from petroleum had reduced, which affected the projects conducted by the public sector. These problems were reflected in instability of administration, changing of productive units' structure, putting more burden on the public budget and deterioration of labour productivity as a result of over-manning. As a

result of these problems, the government started to re-evaluate the domination of the public sector on the productive and services sectors.

Moreover, in recent years, the Libyan government decided to privatise some public companies by selling them to the staff of those companies or people interested in being involved in the private sector. The Central Bank of Libya decided to sell two state banks, named Sahara Bank and Wahda Bank, to individuals or the private sector.

Regarding foreign investment, the government has already taken some steps to reduce these barriers. The Libyan Foreign Investment Board (LFIB) is a government body formed in 1997 with the aim to attract and help foreign investors. In 1987, the Libyan General Peoples Committee issued decision no. 447, concerning transfer of ownership of government plants to employees. That was the first step of the Libyan privatisation programmes. In 1994, 145 plants were transferred to the private sector with immediate effect. In 1995 a further 295 plants had been transferred to the employees. In October 2003, the government of Libya announced its intention to privatise a further 360 industrial and agricultural factories (see Table 2-11).

It executed this in three stages: Ellabbar (2007) said that

> The ownership of 260 factories was to be transferred from the public sector to the private sector immediately in the first stage (ended by the end of 2005). The second stage included 46 factories which were to be privatised by the end of June 2007. The factories in these stages were transformed into shareholding companies in which employees and others are able to own shares. The third stage aimed to privatise 54 factories during the period 2007/2008 (pp.14-15).

The government also decided (by the decision no 313, for the year 2003) to exempt the privatised firms from taxes for five years. In addition, during this period they were able to import equipment and raw materials without paying any fees.

Table 2-11 The Libyan Privatised Plants by Sectors

Sector	Stage1	Stage 2	Stage	Total
Industrial sector	145	41	18	204
Agricultural sector	28	4	24	56
Animalism Fortune Sectc	71	0	11	82
The Sea Fortune sector	16	1	1	18
Total	**260**	**46**	**54**	**360**

Source: The Libyan General Peoples Committee decision no (313) for the year 2003

2.21 Summary

This chapter of this thesis reviewed in detail the main literature relevant to the research focus of this study. In this chapter previous studies have been discussed (such as Back and Bell, 1995, Mashaleh et al, 2005, Sriram and Stump, 2004) related to the impact of IT on performance; few of them studied the impact of specific technology or review the current level of IT use, and found that most of organisations often use computers heavily for managerial tasks. Some of them reported wide usage of basic tools for accounting, spreadsheets and word-processing, and they found limited more advanced tools, and they also discloses increasing use of other tools for instance project web-sites especially on larger organisations. Moreover, some studies (such as Wynn, 2009) discuss the ISs and their impact on organisations, and their contribution to achieving organisations' objectives; they found that all firms have succeeded in their IS investment. Wynn et al. (2009) put forward a method for IS strategy development and implementation; they also suggested that a framework for mapping systems is required in order to track and analyse any important business improvements or changes in procedures that may take place. Certainly the models of Nolan and Zuboff are still relevant today and can be used to assess progress in IS/IT in the Libyan banks and its impact on process change.

Other studies (such as Weill, 1992 and El-Mashaleh et al, 2006) tried to measure the relationship between investment in IT and performance, the majority of these studies found a positive relationship between performance and IT use, and they found that investment in IT generates intangible benefits for organisations. In addition, there are some studies (such as Bharadwaj et al, 1999, Holden and El-Bannany, 2004, Melinda and Stephen, 2001 and Elsabbagh, 2003) investigated the impacts of IT on firm performance, profitability and competitive advantage in the banking sector. The finding from these studies can be summarised as follows; investment in IT generates intangible benefits for organisations; ATMs have a positive effect on bank profitability; IT investment has made a significant contribution to productivity improvements in the railroad industry and ISs contribute to achieving the purposes. These will be reflected in the ability of the company to compete and to earn in the long term. Porter and Millar (1985) have also observed that the IT is influencing the competition in three important ways; it changes industry structure and alters the rules of competition; it creates competitive advantage; and it spawns whole new businesses. Most previous studies indicate that the use of advanced technology have a

positive effect on business performance. IT lies in their ability to achieve many benefits to the organisation such as flexibility and speed of achievement, a reduction costs and in the possibility of providing useful information in a timely manner, ISs is also used at operational level and various activities of the organisation. Moreover, IT can help organisations reduce the costs associated with such activity, through reducing costs of obtaining and analysing information. There are several studies (Bannany, 2004) conclude that investment in the IT leads to a reduction in banking transaction costs, and the number of staff and branches. Moreover it helps to process larger volumes of data and reduce the cost of operating at the same time. In addition, the use of ATMs affects the profitability of an organisation in terms of cost saving and better services. In recent years, there is an increase in investment in advanced technology in Libyan commercial banks, for example, obtaining advanced AIS, installation of networking linkage, and using ATMs and point of sell.

From previous studies it can be concluded that investment in IT has an impact on the performance of organizations through reducing costs, number of staff and branches, whilst on the other hand increasing profitability, creating a competitive advantage, providing new services and improving existing services, these key themes that will be investigated and developed in this study. In addition, considering that the training is part of this investment, this study will investigate the importance of training and up-skilling in making sure the benefits of investment are delivered.

This chapter also reviewed the Libyan economic situation from 1951 until now, highlighting the main features of the Libyan economy and their influence on the banking sector. This situation has been significantly changed since oil was discovered in commercial quantities. The country has moved from a deficit to a surplus economy. Consequently, the GDP and per capita income increased. In addition, oil exportation has provided Libya with considerable foreign currency, which affected the Libyan banking sector leading to the availability of credit. Oil revenues have given the Libyan government enough funds to enable it to play a major role with regard to the development plans. However, in response to the privatisation laws in the early 1990s, the Libyan government undertook steps to liberalise the financial system, the key step has been the promulgation of the new banking law No: 1 of 1993, which allowed private banks to be established.

Hence, the first time since the nationalisation of the banking sector in the country, a private bank was opened in 1995, which was the Commerce and Development Bank. As a matter of fact the banking sector always played an important role in any economy through intermediation between depositors and investors. However, the objectives of the banking industry have undergone fundamental. So the banking function has become broader, and product and geographic markets have become much more integrated. Consequently, banks have moved to introduce new services, thereby intensifying competition among banking firms and other non-banking institutions.

Chapter 3:

Research Methodology

Chapter 3 : Research Methodology

3.1 Introduction

Research is the accurate study and precise targeting to clarify and resolve the problem of different methods and different origins and circumstances of the nature of the problem under investigation (Ryan et al., 2002). The relevant literature together with the research objectives provided the basis for the appropriate methodological approach which determines the data collection and the methods of analysis. Ellabbar (2007) indicated that scientific research is described as an attempt to critically find solutions to the problems faced by humanity and matters of concern and confusion of rights. There are many characteristics of scientific research such as: substantive; susceptibility testing and proof; critical; forecasting; flexibility; of aims to achieve the object and purpose. Also, scientific research aims to achieve many objectives including: adding to the knowledge; description; interpretation; forecasting; compromise; providing evidence linking causes and consequences; and knowledge of the relationship between variables with the elements of the events and their parts. Particularly in accounting, Smith (2003) stated that most forms of accounting research are described as the following stages: "identify broad area; select topic; decide approach; formulate plan; collect information; analyse data; and finally present findings" (p16-17).

The main objective of this research is to explore investment in AISs and its impacts on business performance in commercial banks in Libya. This chapter presents description of the research design and methodology used in the study. This research investigates the adoption of IT in Libyan commercial banks, and to identify the influence of training and up-skilling of the workforce on the accomplishment of investment benefits in Libyan commercial banks.

To help answer the first research question regarding extent of AIS in the Libyan bank case studies, process function maps were first used to depict the deployment of different AIS software to support bank activities. The entity used here could be described as a function or activity within a broader process. This simple top-level mapping has been used in a number of case studies to assess the systems status of SMEs in the UK (Wynn et al, 2009).

3.2 Research Design

When doing research, researchers should use a research design, which represents a logical plan for attainment, from an initial set of questions, of a conclusive set of answers (Yin, 2003). Research design includes deciding, in a logical way, what kind of data needs to be collected, and what methods should be used to analyse the data.

Yin (2003) suggested five components for case design: "study questions, study propositions, unit(s) of analysis, the logic linking data to propositions and the criteria for interpreting the findings" (p.20). Yin further argues that the last two components are the least developed in the case study method. However, the research design can be viewed as part of the whole research process. In this research, the literature review was conducted to develop the theoretical framework, the identification of key issues and testing in the initial exploratory study to identify cases. From this framework, a set of research questions and propositions were developed. The case study approach was seen as the most appropriate to answer these questions, in which a detailed research plan based on the strategy developed by Yin (2003) was set up, including data collection and analysis.

However, to produce knowledge rather than just description, the results of the analysis were reflected and screened against the initial framework, which has led to modifications in the understanding of some of the early issues developed in the literature. This process is a continuous one, in which the design is neither totally rigid nor static. At the end of the process, it is expected to lead to the desired development of theoretical conclusions and thus contribution to knowledge. This research process is reflected in figure 3-1.

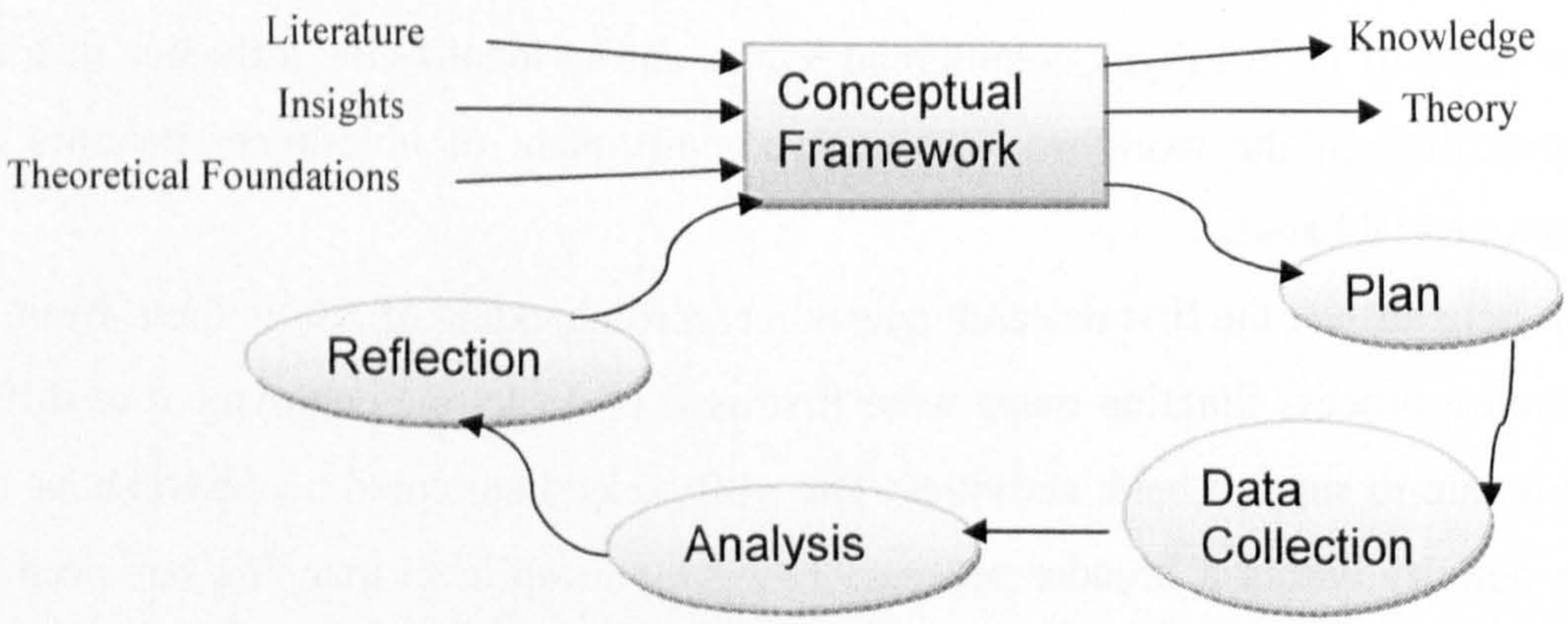


Figure 3-1 Research Process (Source: Maali, 2005)

3.3 Qualitative and Quantitative Research

There are various approaches to research and various authors classify them differently. Research can be distinguished according to its approach. These approaches may imply or presuppose a philosophical position, be it empirical, interpretative, or critical. Research methods can be classified in several ways, the most important way being between qualitative and quantitative methods.

Qualitative research is "an approach to the study of the social world which seeks to describe and analyse the culture and behaviour of humans and their groups from the point of view of those being studied" (Bryman, 1995, p.46). Quantitative researchers have tended to view qualitative research as an exploratory way of conducting social investigations. Quantitative research has an important background in scientific research, where research aims to establish or confirm the truth of a theory and the reality of what happens. It has proved, increasingly, to be unable to secure a comprehensive picture, particularly in the area of social sciences, nor do they reflect the views of the participants and take their positions into account. It thus underestimates the complexity of the experimental conditions (Sarantakos, 2005).

Qualitative research has developed to address such topics. Qualitative researchers wonder on the idea of "truth" or indeed the whole, and debates whether anything can be proved and confirmed. Some groups can give different results. The same applies for: the timing of the research; the attitudes of individuals; the members of the research team; the use of other methods. From this standpoint, no "single truth" can be reached from research (Mason, 2002).

Qualitative methods entail the participation of a researcher in describing and explaining the behaviour of people and events rather than focusing on measurable attributes (Murray, 2003). There are significant differences between the two methodologies. One of the main differences is the way of collecting data, and the mechanisms used to interpret this data. Interviews, official and unofficial documents, participants' observation and different reports are considered as sources for data collection in order to study a social phenomenon using qualitative research (Myers, 1997).

Quantitative research evolved primarily to study natural phenomena. The characteristics of these methods includes: testing theories; creating built conditions to control variables; trying to explain natural phenomena as a result of a theory; a viewpoint of the interior; and it is essential to study natural phenomena in terms of assumptions. Qualitative research evolved primarily to study social phenomena, which includes: case study research; action research; and ethnography.

Moreover, Sarantakos (cited in Ellabbar, 2007) indicated that:

> "Qualitative methodologies assume that the social world is always a human creation, it studies a small number of respondents, employs no random sampling techniques, it uses no quantitative measures or variables, it aims to study reality from the inside not from outside, and it leads to an interpretive inquiry" (p.83).

Moreover, from the main features of the qualitative approach is the reliability is low and the validity is high, contrary the quantitative approach, the reliability is high and validity is low. (Collis and Hussey, 2003)

This study will employ a collective case study approach to "study a number of cases jointly in order to inquire into the phenomenon, population or general condition" (Denzin and Lincoln, 1995, p.89).

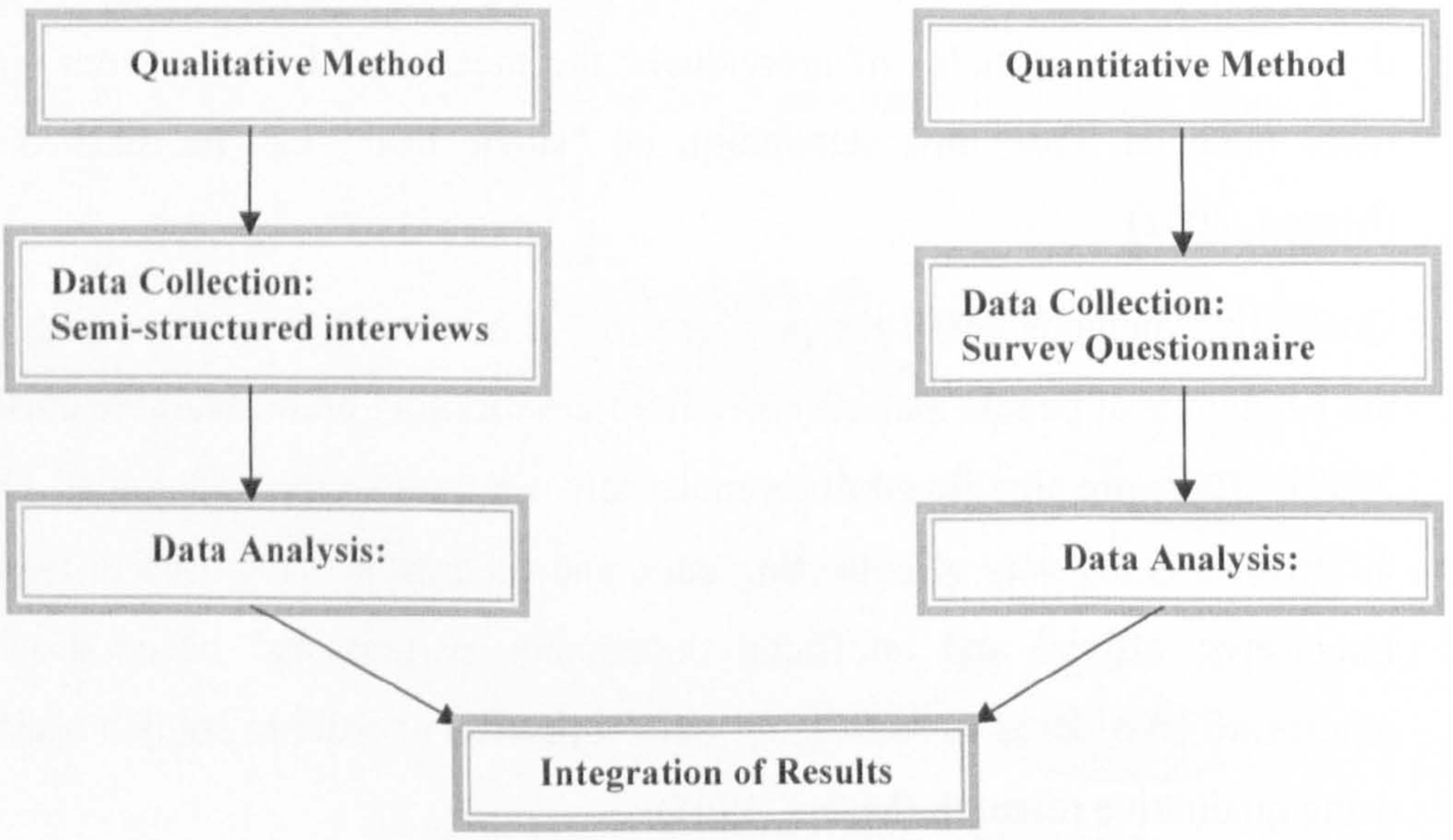


Figure 3-2 The structure of the mixed method approach for this study

3.4 Exploratory Study

An explorative study was conducted in October and November 2008, by interviewing nine managers / staff within nine banks that are the subject of this research and the questionnaire had been filled during the interview. The aims of the interviews were to know the extent and nature of investment in AIS in Libyan commercial banks, to ensure what was relevant and appropriate regarding the topic; and to investigate which banks would co-operate in helping the researcher to hold the main interviews. It was also used to assess the relevance of some of the key issues identified in the literature review in the context of the Libyan commercial banks.

Accordingly the main results of this work can be generalised as follows:

The total number of the banks who agreed to co-operate in this study was fixed at three banks (Wahda Bank, Bank of Commerce and Development, and Alejmaa Alarabi Bank). The study concentrated on pertinent bank personnel and it was decided that the study should cover the three banks spread over Benghazi city, according to explorative study findings in next chapter, access available and factors of time and cost. The suitable time to conduct the study was from October 2009 to January 2010.

3.5 Case Study Method

"As a research strategy, the case study is used in many situations to contribute to our knowledge of individual, group, organisational, social, political, and related phenomena" (Yin, 2003, p.1). Hussey and Hussey (1997) refer to case studies as "an extensive examination of a single instance of a phenomenon" (p.65). Yin (2003) provided a comprehensive definition of case study as:

> "An empirical inquiry that [1] investigates a contemporary phenomenon within its real life context, especially when the boundaries between phenomenon and context are not clear... The case study inquiry copes with the technically distinctive situation in which there will be many more variables of interest than data points, and as a result [2] relies on multiple sources of evidence, with data needing to coverage in a triangulating fashion, and [3] benefits from the prior development of theoretical propositions to guide data collection and analysis" (pp13-14).

This definition of a case study includes a precise description of the situation where a case study is better than other methods of inquiry. This situation occurs when researcher believes that the context of the phenomenon that are under investigation affects on the phenomenon, and when there is a distinctive situation and thus diverse sources of evidences are required. Case study allows the research process to be open and flexible and the action of the researcher are not restricted or directed to prearranged goals or actions. It allows researchers to record interpreted reality which is constituted by the interaction between actors. The case study strategy has a numerous objectives, for example, it can be considered a suitable strategy to describe a phenomenon, build theory, and test theoretical concepts and relationships.

However, a case study is also a suitable method for testing theoretical propositions, which are concerned with validating hypotheses. In this instance, using its deductive characteristics, where data are collected pertaining to theoretical propositions. The hypotheses are then tested by comparing the data with the conjectures. The relationship between qualitative methodology and case study method is very well defined. Case study provides a strong empirical foundation for the collection of qualitative data in generating theory about the real world (Scapens, 1990).

Tellis (1997a) said that "case study can be seen to satisfy the three tenets of the qualitative methods; describing, understanding and explaining" (p.4). According to Ryan et al, (2002),

> "Descriptive case studies that describe accounting system, techniques and procedure used in practice. A number of companies may be selected to describe different accounting practices or the similarity of practices in different companies. The research objective of theses studies is to provide a description of accounting practice. Such studies may be useful in exploring the use of traditional or more modern accounting practices" (p143).

Spicer (1992) grouped case studies into two major categories. In the first place, descriptive and/or exploratory case studies. In the second place, informative or explanatory case studies. The difference between these categories of case studies is not completely clear. Yin (1994) suggested that case studies have been defined as exploratory when only the researcher who ultimately determines the difference between the two categories according

to type of the research and the methodology (Ryan, et al., 2002; Ferreira & Merchant, 1992; Spicer, 1992). The use of the case study method is now more widely accepted for social science research (Silverman, 2001) and particularly for areas of performance management and management it is relevant where the phenomenon to be investigated is based in a real life context (Yin, 2003)

Moreover, the case studies are becoming increasingly popular in accounting research (Ryan et al., 1992). Yin also argued that (as cited in Taweel, L, 2001) "case studies are particularly appropriate in areas where theory is not well developed" (p.139). Such studies represent an exploratory device that can be used as a precursor to scientific research.

For the following reasons the case study method is an adequate research strategy for this research project: the objectives of the research project; the qualitative paradigm adopted; and the exploratory nature of this research project, direct contact with the organisations' staff in an attempt to obtain further dependable knowledge. Additionally, Yin (as cited in El-Shukri, 2007) said that:

> "The case study method allows the researcher to have a great degree of flexibility and motivates the researcher to get an adequate range concerning the amount of data to be collected, the collection procedures and the sources of information to used" (pp.145-146).

In addition case studies include a variety of data collection methods including document analysis and interviews, as well as technique of data triangulation to establish the validity of data. Data triangulation involves "using multiple sources of evidence" (Yin 2003, p.97). These are adopted in this study, for they permit a greater understanding of the particularities of accounting information objectives and development needs in the Libyan research setting than do research methods limited to surveys and questionnaires.

There are several advantages and strengths in adopting the case study approach. First, a case study gives researchers the opportunities to observe events, incidents and happenings as they emerge in their natural such as interviews, observations and documents which increase the reliability of research findings (Ferreira and Merchant, 1992; Yin, 1994). Second, it allows researchers to recognise any discrepancies in information which will ensure further exploration (Ferreira et al., 1992; Yin, 1994). Third, a case study can continue over a period of time which permits researchers to maintain a continuous trend of

observations (Ferreira et al., 1992; Yin, 1994). Finally, collected data and emerging findings can be constantly inspected and refined to enhance their reliability (Yin, 1994; Ryan et al, 2002).

3.6 Research Techniques

"Case studies require a detailed, in depth data collection involving multiple sources of information rich in context" (Creswell, 1998, p.61). As many sources of data are used, the triangulation as a way of combining data from diverse sources is introduced in the first part of this section.

3.6.1 Triangulation

Stake (cited in Tellis, 1997b) stated that "the protocols that are used to ensure accuracy and alternative explanations are called triangulation" (p.2). In the case study, to ensure accuracy and alternative explanations could be don buy using different sources of data, Yin (cited in Tellis, 1997b). Flick (2002) has defined triangulation as "the combination of different methods, study groups, local and temporal settings and different theoretical perspectives in dealing with a phenomenon"(p.229). The diverse sources of data and methods of analysis have several benefits, "it allows the researcher to address a broader range of historical and behavioural issues. It also leads to the case study becoming more convincing and accurate" (Yin, 2003, p.93). Researchers use triangulation to validate their results, allowing them to be more confident of results (Jick, 1979). Furthermore, triangulation allows the researcher to integrate facts in cases when different sources of data provide either similar or conflicting evidences: when different method leads to similar interpretation, the researcher will be more confident about the findings and the conclusions drawn from the different methods can mutually reinforce each other and thus strengthen the reliability of conclusions. On the other hand, the different methods lead to different interpretations; this encourages the researcher to look and interpret the conditions and reasons for the divergences (Potter, 1996).

For the above reasons, it was decided to include a range of different data collection methods, namely interviews, observations and document analysis.

3.6.2 Data Collection Methods

Data can be collected in various ways, in different situations and from different sources; which may be primary or secondary. Yin (1994) stated that six important sources of evidence can be used: "documentation; archival records; interviews; direct observation; participant observation; and physical artefacts" (p.85).

Waters (1998) stated that data can be collected by observation in many cases and in other cases it can be collected by asking people relevant questions using for example: personal interview; telephone interview and postal survey.

3.6.2.1 Surveyed Questionnaire Method

The surveyed questionnaire method is "carried out for descriptive purposes, so it can provide information about the distribution of a wide range of characteristics and of relationships of such characteristics" (Robson, as cited in Taweel, 2001, p.137).

In order to cover a large area at minimum cost, the decision was made to collect the necessary data through the use of a structured questionnaire. A survey was conducted of 9 various private and public commercial banks located mostly in Tripoli and Benghazi during the period of September-November 2007. The questionnaire was filled in the presence of the researcher to guarantee the best response. The questionnaire was to be answered by the financial managers within a sample of 9 banks. The questionnaire was basically designed to examine the accounting systems being used by Libyan Commercial Banks and assess the relevance of some of the key variables identified in the literature review and refine them for more in-depth case study analysis. The self-administered questionnaire was developed from the research questions and in the light of prior studies.

It is worth noting that this questionnaire was conducted at an early stage of the research and it was derived from AISs literature. The questionnaire was first designed in English, and then translated into Arabic, which is the language spoken and written in Libya. Before the final typing of the questionnaire, its early drafts were reviewed by the researcher's supervisors in the University of Gloucestershire. The complete questionnaire and covering letter are presented in Appendix 1and 2.

3.6.2.2 Interview Method

The interviewing is used widely, as a method for data collection in the social sciences, a common method in accounting research and an essential source of case study evidence (Yin, 2003). Merriam (1998) also stated that "in qualitative research, interviewing is often the major source of qualitative data needed for understanding the phenomenon under study" (p.93).

In social research, many researchers preferred personal interviews as "the most powerful and useful method because it empowers the researcher to collect sociological facts and psychological facts (Abdullahi, 1993). Interview might be defined as, "A method of data collection that gathers information through oral questioning" (Sarantakos, 2005, p.428). In the process of collecting data through interviews there are a number of steps which might be followed, and there is a general level of agreement that these include the following steps: seeking the respondents; asking and recording the questions; field supervision; checks; and completion of the interview (Sarantakos, 2005).

Interviews in qualitative research are characterised by many special criteria: open-ended questions are used only when questioning one person at a time; the question structure is not fixed; and the interviewer has more freedom (Sarantakos, 2005). Also the interview may be classified into two forms: one-to-one; or one-to-many interviews; as illustrate in figure 3-3.

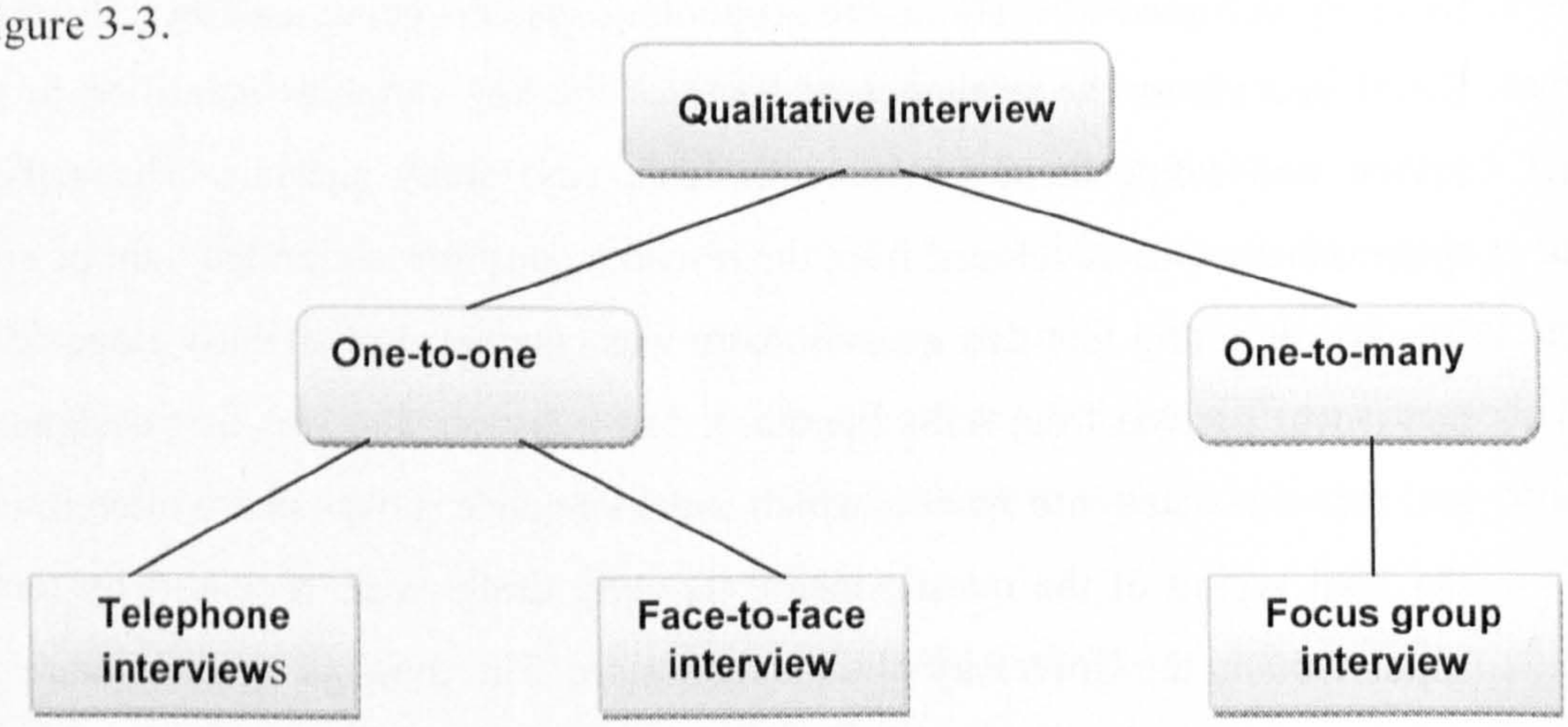


Figure 3-3 Forms of Qualitative Interview

Source: Saunders, Lewis and Thornhill, 2003, p.247

Interviews were chosen because they were most likely to generate high-quality, rich, nuanced data (Seidl, 2007). The one-to-one interview is the most common form of interview which "involves a meeting between one researcher and one informant face-to-face or by telephone" (Denscombe, 2007, p.177).

Sarantakos (2005) distinguished three types of interviews, these include: structured interview; semi structure interview; and unstructured interview. The following are definitions of these interview types:

1. Structured Interviews:

Structured interview are applicable when researchers know exactly what information is needed and they have predetermined questions for participant (Sekaran, 2000)

Saunders et al., (2003) stated that "Structured Interviews use questionnaires based on a predetermined and standardised or identical set of questions. The researcher read out each question and then records the response on a standardised schedule, usually with pre-coded answers" (p.246).

2. Semi structured Interviews:

"In the Semi structured Interviews researcher has a list of themes and questions to be covered, although these may very from interview to interview. The order of questions may also be varied depending on the flow of the conversation. On the other hand, more questions may be required to explore research question and objectives given the nature of events within particular organisations" (p.433). Saunders et al., (2003) stated that:

> "In the Semi structured Interviews researcher has a list of themes and questions to be covered, although these may very from interview to interview. The order of questions may also be varied depending on the flow of the conversation. On the other hand, more questions may be required to explore research question and objectives given the nature of events within particular organisations" (p.246).

3. Unstructured Interviews:

The unstructured interview is the most common used in qualitative studies (Sarantakos, 2005). In this type, case study researchers enter the interview setting without defined

detailed questions that they would be asking the participant. The wording of the questions, the order of questions and the interview schedule are not restricted.

A semi-structured interview was followed, as it allows the researcher to explore and understand the issues that the literature review had already uncovered (Cavana et al., sited in Seidl, 2007, p.56). To mine the rich information from participants, researchers argue that semi-structured interviews are an appropriate choice (e.g. Strauss & Corbin, 1999; Miles and Huberman, 1994; Hussey et al., 1997; Sekaran, 2000).

Sarantakos (2005) stated that the advantages of interviewing as a research method following are: it provides researchers with a means of flexibility to deal with different situations; it results in a high response rate; it gives researchers an opportunity to correct any misunderstanding information; it enables researcher to use more complex questions. Despite the advantages, interview methods demonstrate some disadvantages; the most common are the following; more costly and time consuming and the possibility of very high personal bias in the data.

The data in this part was collected using semi-structured face to face interviews with pertinent bank personnel from Libyan Commercial Banks. The researcher decided to employ semi-structured and open question interviews using the research objectives as a basis for asking questions.

In this research, the semi-structured interviews are used to obtain the views of the target population, and also to understand an interviewee's experiences and impressions. The interview was designed to take no more than approximately one hour and all interviews were tape recorded except two, because they did not wish to be taped. All interviewees were provided with a summary of the research objectives prior to the actual interview. The interview questions were developed from the research questions and in the light of prior studies. It was piloted with PhD research students and in the Business School at the University of Gloucestershire. The interview questions include four parts of questions asked to all participants. The first part: questions about the interviewee's position, experience and qualifications. The second part: includes seven questions included one checklist question to survey the perceptions about the extent and nature of accounting information system investment .the third part: includes thirteen question included five

checklist questions to survey the perceptions about the investment in AIS, business processes and business performance. The fourth part: includes six questions included one Checklist Question to survey the perceptions about the importance of training and up-skilling of the workforce.

3.6.2.3 Observation

Observation is another way to gather and to record information about the processes, activities and people and their behaviour in their natural work environment by describing what they actually do (Sekaran, 2000). Therefore, researcher should have the ability to know what should be recorded and how to record in a reliable and accurate way for valuable. Accordingly to Waters (2001), Sarantakos (2005) and many other authors; observation is the best way to directly study several types of phenomena and does not require a great effort to be made by the group. It enables a researcher to gather all the data under familiar behavioural conditions.

3.6.2.4 Documents

Documents are an important source of information about organisations and the surrounding environment. They represent written evidence, and as such, save the researcher the time and expense of transcription work (Creswell, 2003). Yin (2003) argues that the essential usage of documents is to support evidence from other sources. However, in some cases, documents can be one of the key sources of information, such as the case of the annual reports in many disclosure studies. It is unusual that any research study is carried out without employing some form of documentary method (Sarantakos, 2005). There are many advantages of the documentary method such as: a huge amount of high quality information is held in documents; normally access to the sources is quick and easy with low-cost; a source of data is available in a form that can be checked by others; and the documents are produced without being requested.

The documents inspected in this study included a range of publicly available documents, such as annual reports, the banks' published advertisements and documents, and the Central Bank of Libya.

3.6.3 Validity of the Research Methods

May (2001) has mentioned that a questionnaire and personal interview are methods for measuring ideas and testing hypotheses. So, the questions must not only reflect the survey's aims, but also must be understood by respondents in a clear and unambiguous way. Hence, before applying any test it is necessary to ensure that it is a valid measurement too. Therefore, there is a need to check its validity. The term validity is one that is frequently used in the world of research and measurement. Neuman (2000) added that the validity of survey is the degree of fit between a construct a researcher uses to describe, theorises, or analyses the social world and what actually occurs in the social world. It means truthful. It aims to make sure that survey items are clear and understandable, and the conceptual and operational definitions mesh with each other. There are two types of validity, internal and external validity. Internal validity refers to the accurate attribution of observed results to the factors that were supposed to be responsible for these results. External validity denotes the applicability of research results to instructional and research contexts other than the one in which the research was carried out. Neuman (2000) added that both internal and external validity are primarily used in experimental research. He added, also, that internal validity is used to make sure that there were are possible errors or alternative explanations with results or not that raise despite attempts to institute controls, while external validity is used to measure the ability to generalise from a specific sample to a wider population. Although it is not possible to have absolute confidence about measurement of survey validity, some measures are more valid than others. There are many types of validity, such as face validity, content validity, criterion validity, construct validity and concurrent validity (Neuman, 2000). Each type of validity is tested in a different way. The easiest type to achieve and the most basic kind is face validity. This is a judgement by the scientific community that the indicator really measures the intended construct (Neuman, 2000). The researcher selected face validity to measure the validity of the survey tools because it is the most common and the most suitable measure for this study.

To measure the validity of the survey used in this study and confirm clarity of the items and their relevance to their scales and sections, the following steps were undertaken:

- A copy of the questionnaire and interview questions was discussed with Dr. Martin Wynn and Professor Robert Greenwood, the supervisors of the researcher.
- A copy of the questionnaire and interview questions was distributed to five of the teaching staff in Garyounis University in Libya.
- A copy of the questionnaire and interview questions was distributed to five Ph.D students in Gloucestershire University and other UK universities.
- A letter was given to these 10 assessors indicating the nature and the aim of the survey and telling them that they were not asked to respond to the items, but to judge whether or not the items met the necessary criteria.

Around half an hour was spent with each person, face to face or by telephone to discuss all their notes, comments and their opinions. A number of items of the questionnaire and the personal interview questions were changed and few items were removed according to the assessors' recommendations. In addition, most items were rearranged in a new sequence. The questionnaire and interview questions were developed in the UK, an English-speaking country, but the mother tongue of the respondents and interviewees is Arabic. In view of this fact, it was necessary to translate the survey instruments into Arabic. Both the questionnaire and interview questions were translated by the researcher. Consultation was held with two Libyan Ph.D. students in Business School at Gloucestershire University. This group was asked to comment on the wording, style presentation of the questionnaire and interview questions, and their comments and suggestions were taken into account to produce an amended translation.

3.7 Population and Sample Research

The financial services industry has been seen as an appropriate business sector to conduct this research, particularly in the light of such issues as the development of information technology and the emergence of globalisation that have changed the banking market. Collis and Hussey (2003) have defined a research population as any exactly defined set of people, or collection of items under investigation. Similarly, Sekaran (2000) also defined a research population as "the entire group of people, events, or things of interest that the researcher wishes to investigate" (p.127). Moreover, Tellis (1997a) stated that "it is a fact that case studies do not need to have a minimum number of cases or to randomly cases" (p.5).

After the screening investigation in exploratory study (Chapter 4), the number of banks that will be appropriate for inclusion for the main data gathering phase has been determined. In the light of the definitions mentioned above and findings of exploratory study, the targeted population includes pertinent bank personnel in three major Libyan commercial banks, which are Commerce and Development Bank, Wahda Bank, Alejmaa Alarabi Bank and Mediterranean Bank. The researcher chose these three banks which represent successful case among the Libyan banks according to explorative study (Chapter 4), access available and factors of time and cost. With respect to the number of case-studies to be conducted, while there is no perfect number of cases. Yin (1994) stated that in multiple case designs, it is not possible to specify with any rigour how many cases should be incorporated.

An important point to be mentioned is that the population of this study is limited to three Libyan banks due to the following reasons:

1. Similar conditions and environment that the Libyan commercial banks deal with, where all banks are operating under the same laws, which are governing the banking business and under supervision and control of the central bank of Libya.

2. Degree of access available and factors of time and cost. The banks which have been selected have higher degree of access than other banks due to the researcher having a relationship and prior dealings with these banks.

3. The banks which have been selected are different in terms of size and date of establishment. This will contribute to a generalisation of the results to the study population.

4. There is some uncertainty concerning the future of modern banks and small banks in terms of their incorporation with other small banks due to the lack of capital which is required by the BCL, as mentioned in the interview with the deputy manger of monetary and banking supervision department at the BCL.

5. Time is very important factor in terms of investment in IT and performance, Weill and Olson (1988) suggested that "investment and performance be measured for five

years to allow for lag effects", for that reason, banks which were established up to five years will not be selected.

6. To extend the banks number of data collection to include other banks, would be prohibitively expensive in terms of time, effort and costs.

3.8 Data analysis

The Qualitative Data Analysis Protocol (QDAP) is a qualitative data analysis technique suggested by Miles and Huberman (1994). It represents a set of systematic and structured data reduction, summarisation, classification and interpretation techniques

The analysis of qualitative data started in the early stages of data collection; after each interview, a contact summary sheet was prepared, containing a summary of the main points raised during the interview, giving a first impression of the data, and summarising the information obtained (Miles et al., 1994, p. 53).

Analysis of the data collected from the three cases studies was undertaken manually by using spreadsheets. Principally, the analysis process was applied to the fundamental data acquired through personal interviews with the participant in the study, and from documents and observations made in meeting. Qualitative analysis of these data includes comments on them with a focus on observing some matters that arose during the researcher's presence in the bank. Regarding quantitative data in the first stage if the study, due to the small size of the respondent population (9 participants) a descriptive statistics test was employed and the result of it was determined. Discovering and understanding the extent and nature of AIS investment in Libyan commercial banks, the role of AIS investment in improving business performance, and the important of training and up-skilling of the workforce in making sure the benefits of investment are delivered, were the key objectives in gathering and analysis data.

3.9 Summary

In view of the lack of published research on the AIS and IT usage in Libya, three methods were followed to collect data concerning the current status of the AIS:

1. Surveyed questionnaire looking at accounting technology within Libyan commercial banks.

2. Structured case study evaluating the management and communication strategy of AIS and IT within three selected Banks.
3. Interviewed questionnaire with the pertinent bank personnel at the Libyan commercial banks.

According to findings of the exploratory study, those indicate there is a general trend between Libyan banks to invest in advanced technology which need to study in depth, to determine influence this investment on business performance and role of training and up-skilling to accomplish the investment benefits. In this research, in order to achieve the main aims of the study, as mentioned earlier in detail in chapter 1, four research objectives have been designed. Figure 3-4 illustrates the connection between research objectives, questions and the methods used to answer every question.

Objective 1:

Explore investment in accounting information system (AIS) in the commercial banks in Libya.

Objective 2:

Map and analyse the business processes linked the deployment of AIS, and determir their significance in overal business improvement.

Objective 3: Determir how business performance has been influenced by investment in AIS.

Objective 4:

Identify the influence of training and up-skilling th workforce on the accomplishment of investment benefits in LC

Q1: What is the extent and nature of AIS investment in Libyan commercial banks (CBL)?

Q2: Has investment in AIS resulted in significant change in business processes? If so, what role has this played in improving business performance in CBL?

Q3: How important is training and up-skilling of the workforce in making sure the benefits of investment are delivered?

Data *Collection Method(s):*
A- Structured interviews (has been done in stage 1)
B- Semi-structured interviews and Check list
C- Documentation

Data Collection Method(s):
A- Semi-structured interviews and Check list
C- Documentation

Data Collection Method(s):
A Semi-structured interviews and Check list
B- Documentation

Figure 3-4 Objectives, Research Questions, and Data Collection Methods

Chapter 4:
An explorative study of Nine Libya banks Commercial Banks

Chapter 4 : An explorative Study of Nine Libya Banks Commercial Banks

4.1 Introduction

During the visit to the commercial banks in Libya which the researcher completed, to explore the extent and nature of AIS in Libyan commercial banks, firstly the researcher met Mr. Abdelmaged Almakori, who is deputy manager of monetary and banking supervision department at the Central Bank of Libya, who advised me not to include Alwafa Bank, Mediterranean Bank, Alsaraya Trading And Development Bank, Arab Commercial Bank and United Bank for Trade and Investment within the sample of study. Due to the completion of the required capital from the Central Bank of Libya, these banks will not exist at the end of 2008 and will be integrated with each other or with other commercial banks.

The first phase of this study is to discover the extent and nature of AISs currently adopted by Libyan commercial banks, and also to determine the number of banks that are appropriate for inclusion for the main data gathering phase. To achieve these objectives, a semi-structured interview was carried out. The questionnaires were conducted and filled in through face-to-face interviews of 9 pertinent bank personnel.

The chapter is divided into the following sections. Section 1 is an introduction. Section 2 is a description of the questionnaire variables, which are interviewees, the Libyan commercial banks and AISs. Section 3 is the summary of the chapter.

4.2 Descriptions of the Questionnaire Variables

Frequency distributions will be used to describe the background characteristics of interviewees and their banks, and will also present the AIS in Libyan commercial banks.

4.2.1 Descriptions of Interviewees – (background and demographic information)

In section one of the questionnaires, interviewees were required to answer a few questions about demographic information of the interviewees and their experience with AIS. In the discussion of the experience and background of interviewees there were two main objectives: firstly, to help in categorizing interviewees into different sub-groups to ascertain if their answers were significantly dissimilar across the sub-groups; secondly, to help in evaluating the importance of each sub-group within the total group.

- **Descriptions of Interviewees – Education**

According to the level of education, interviewees were grouped into three groups: below university degree, university degree and higher university degree. Table 4-1 shows that of the 9 interviewees, there were 2 interviewees (22.2%) qualified to below university level. They were an executive manager of Sahara Bank and a division manager of National Commercial Bank. There were 6 interviewees (66.7%) with a university degree, five of whom were executive managers of the following banks: Wahda Bank, Commerce & Development Bank, Aman Bank for Commerce & Investment, National Banking Corporation and Alwaha Bank. However, one of them was a general manager of Alejmaa Alarabi Bank. There was 1 interviewee (11.1%) with a higher qualification, who is an executive manager of Gumhouria Bank.

Table 4-1 Interviewees Groups - Education

Level of Education	Frequency	Percent
1-Below university degree	2	22.2 %
2-University degree	6	66.7 %
3-higher University degree	1	11.1 %
Total	9	100 %

This indicates that the majority of the interviewees had obtained a university degree; a minority of the interviewees has a higher qualification.

- **Descriptions of Interviewees – Positions**

According to their position in the bank, interviewees were grouped into four groups: General Manager, Executive Manager, Division Manager and Staff. Table 4-2 shows that of 9 interviewees, there was 1 interviewee (11.1%) the General Manager of the Alejmaa Alarabi Bank, 7 interviewees (77.8%) were the Executive Manager of the Wahda Bank, Commerce & Development Bank, Aman Bank for Commerce & Investment, National Banking Corporation, Alwaha Bank, Sahara Bank and the Gumhouria Bank, 1 interviewee (11.1%) was the Division Manager of the National Commercial Bank and there was no interviewee in the staff group. The staff was chosen in different positions in order to survey the knowledge of as many different levels of Libyan staff as possible concerning AIS.

Table 4-2 Interviewees Groups - Positions

Positions	Frequency	Percent
1- General Manager	1	11.1 %
2- Executive Manager	7	77.8 %
3- Division Manager	1	11.1 %
4- Staff	0	0 %
Total	9	100 %

- **Descriptions of Interviewees – Department:**

According to their department, interviewees were grouped into four groups: Finance & Accounting, ISs/IT, Senior Executive and Other. Table 4-3 shows that, the majority of interviewees (88.9%) were working in Finance & Accounting Department, 1 interviewee (11.1%) was from Senior Executive of the Alejmaa Alarabi Bank and there were no interviewees from the IS Department or other department.

Table 4-3 Interviewees Groups – Department

Department	Frequency	Percent
1- Finance and Accounting	8	88.9 %
2- ISs/IT	0	0 %
3- Senior Executive	1	11.1 %
4- Other	0	0 %
Total	9	100 %

- **Descriptions of Interviewees – Period of this Function:**

Interviewees were divided into four groups depending on the length of time they had their position: Under 5 years, From 5 to 10 years, From 11 to 20 years and Over 20 years. Table 4-4 shows, of the 9 interviewees, 5 interviewees (55.6%) have worked less than 5 years in the following banks; the Commerce and Development Bank, National Banking Corporation, Aman Bank for Commerce and Investment, Alejmaa Alarabi Bank and Alwaha Bank. 3 interviewees (33.3%) have worked from 5 to 10 years in the following banks; the Wahda bank, Sahara Bank and the Gumhouria Bank. 1 interviewee (11.1%) has worked from 11 to 20 years in National Commercial Bank and there were no interviewees who have worked for more than 20years.

Table 4-4 Interviewees Groups – Period of this Function

Period of this Function	Frequency	Percent
1-Under 5 years	5	55.6 %
2-From 5 to 10 years	3	33.3 %
3-From 11 to 11 years	1	11.1 %
4-Over 20 years	0	0 %
Total	9	100 %

- **Descriptions of Interviewees – Working Experience:**

According to their working experience, interviewees were divided into four groups: Under 5 years, From 5 to 10 years, From 11 to 20 years and Over 20 years. The figures in table 4-5 show, of the 9 interviewees, 1 interviewee (11.1%) has work experience of under 5 years, 2 interviewees (22.2%) have working experience of 5 to 10 years, 2 interviewees (22.2%) have working experience of 11 to 20 years, and 4 interviewees (44.4%) have working experience of over 20 years.

Table 4-5 Interviewees Groups – Working Experience

Years of Working Experience	Frequency	Percent
1-Under 5 years	1	11.1 %
2-From 5 to 10 years	2	22.2 %
3-From 11 to 20 years	2	22.2 %
4-Over 20 years	4	44.5 %
Total	9	100 %

- **Descriptions of Interviewees – Working Experience with AIS**

According to their years of working experience with AIS, interviewees were divided into four groups: under 5 years, From 5 to 10 years, From 11 to 20 years and Over 20 years. The figures in table 4-6 show, of the 9 interviewees, there were 2 interviewees (22.2%) have working experience with AIS of under 5 years, 2 interviewees (22.2%) have working experience with AIS of 5 to 10 years, 3 interviewees (33.3%) have working experience of 11to 20 years, and 2 interviewees (22.2%) have working experience of over 20 years.

Table 4-6 Interviewees Groups – Working Experience with AIS

Years of Working Experience	Frequency	Percent
1-Under 5 years	2	22.2 %
2-From 5 to 10 years	2	22.2 %
3-From 11 to 11 years	3	33.4 %
4-Over 20 years	2	22.2 %
Total	9	100 %

- **Descriptions of Interviewees – main role relative to AIS**

Regarding the main role relative to AIS, interviewees were required to answer a question about their main role relative to AIS, and they were given five roles to select as follows;-

Collect accounting information

Manage those who collect accounting information

Use accounting information in tasks

Work as a ISs professionals

Manage ISs professionals

The main roles of all the interviewees were included:-

1- Manage those who collect accounting information.

2- Use accounting information in tasks.

Five of the interviewees in addition to carrying out the above mentioned roles, also collect accounting information.

4.2.2 Distribution of the Libyan Commercial Banks.

To get more general information about Libyan commercial banks, the interviewees were required to answer several questions about their banks. These questions can help in evaluating the importance of each sub-group within the total group.

- **Distribution of the Libyan Commercial Banks - Ownership of Bank:**

According to their banks ownership, interviewees were grouped into three groups: State-owned banks, Private Banks and Mixed. Table 4-7 shows that of the 9 banks, there were 4 state- owned banks (44.4%) which are the Gumhouria Bank, National Commercial Bank, National Banking Corporation and the Alwaha Bank. There were 4 private banks (44.4%) which are the Sahara Bank, the Commerce and Development Bank, the Aman Bank for Commerce and Investment and Alejmaa Alarabi Bank and there was 1 mixed ownership banks (11.2%) which is the Wahda Bank.

Table 4-7 Banks Groups – Ownership of Banks

Ownership of Banks	Frequency	Percent
1. State-owned Banks	4	44.4 %
2. Mixed	1	11.2%
3.Private Banks	4	44.4 %
Total	9	100 %

- **Distribution of the Libyan Commercial Banks - Date of Establishment**

The banks can be sub-divided according to length of their establishment into three groups: More than 10 years, From 5 to 10 years and Less than 5 years. Table 4-8 shows that of the 9 banks, there were 5 banks (55.6%) which are Gumhouria Bank, National Commercial Bank, Commerce & Development Bank, Wahda Bank and Sahara Bank that were established for more than 10 years, 3 banks (33.3%) which are Aman Bank for Commerce and Investment, National Banking Corporation and Alejmaa Alarabi Bank that were

established from 5 to 10 years and 1 bank (11.1%) which is Alwaha Bank that was established for less than 5 years.

Table 4-8 Banks Groups – Date of Establishment

The age	Frequency	Percent
1. More than 10 years	5	55.6 %
2. From 5 to 10 Years	3	33.3 %
3. Less than 5 years	1	11.1 %
Total	9	100 %

- **Distribution of the Libyan Commercial Banks – Annual Revenue**

According to annual revenue in Libyan Dinars, banks were grouped into 4 groups: More than 100 million LYD, From 50 million to 100 million LYD, From 10 million to Up to 50 million LYD and Up to 10 million LYD. From table 4-9 as can be seen, of the 9 banks, there were 3 banks (33.3%) with an annual revenue of more than 100 million LYD, 1 bank (11.1%) with an annual revenue of 50 to 100 million LYD, 3 banks (33.3%) with an annual revenue of 10 to less than 50 million LYD and 2 banks (22.2%) with an annual revenue of up to 10 million LYD.

Table 4-9 Banks Groups – Annual Revenue (Million/Dinars)

Annual Revenue	Frequency	Percent
1.More than 100 M/LYD	3	33.3 %
2.From 50 to 100 M/ LYD	1	11.1 %
3.From 10 to up to 50 M/ LYD	3	33.3 %
4. Up to 10 M/ LYD	2	22.3 %
Total	9	100 %

- **Distribution of the Libyan Commercial Banks – Banks Total Assets:**

Banks were grouped into four groups according to bank total assets: More than 100 million LYD, From 50 million to 100 million LYD, From 10 million to up to 50 million LYD and Up to 10 million LYD. As can be seen, from table 4-10 of the 9 banks, 8 banks (88.9%) have total assets of more than 100 million LYD, 1 bank (11.1%) has from 50 to 100 million LYD and there is no bank that has up to 50 million LYD in total assets.

Table 4-10 Banks Groups – Total Assets (Million/Dinars)

Bank Total Assets	Frequency	Percent
1.More than 100 M/ LYD	8	88.9 %
2.From 50 to 100 M/ LYD	1	11.1 %
3.From 10 to up to 50 M/ LYD	0	0 %
4. Up to 10 M/ LYD	0	0 %
Total	9	100 %

- **Distribution of the Libyan Commercial Banks – Banks Total Employees:**

Banks were divided into four groups according to bank total employees: More than 1000 employees, From 500 to 1000 employees, From 100 to less than 500 employees and Up to 100 employees. As can be seen from table 4-11, of the 9 banks, 5 banks (55.6%) have more than 1000 employees, 1 bank (11.1%) has from 500 to 100 employees, 3 banks (33.3%) have from 100 to up to 500 employees and there is no bank that has up to 100 employees.

Table 4-11 Banks Groups – Total Employees

Bank Total Employees	Frequency	Percent
1.More than 1000	5	55.6 %
2.From 500 to 1000	1	11.1 %
3.From 100 to up to 500	3	33.3 %
4. Up to 100	0	0 %
Total	9	100 %

- **Distribution of the Libyan Commercial Banks - Staff Working in Interviewees' Department:**

Banks were grouped into four groups according to the number of staff work in interviewees' department: Over 20 staff, From 10 to 20 staff, from 5 to 10 staff and Less than 5 staff. As can be seen in table 4-12, of the 9 banks, 6 departments (66.7%) have over 20 staff, 1 department (11.1%) has from 10 to 20 staff, 2 departments (22,2%) have from 5 to 10 staff and there is no department with less than 5 staff.

Table 4-12 Banks Groups – Number of Staff

Number of Staff	Frequency	Percent
1.Over 20 staff	6	66.7 %
2.From 10 to 20 staff	1	11.1 %
3.From 5 to 10 staff	2	22.2 %
4. Less than 5 staff	0	0 %
Total	9	100

4.2.3 Distribution of AISs

In section one of the questionnaires, interviewees were required to answer few questions about their banks' AIS (AIS) in order to highlight the nature and extent of AIS in Libyan Commercial Banks.

- **Distribution of AIS – Kind of Systems being used for AIS:**

According to the type of systems in use in AIS, banks were grouped into three groups: Manual, Computerised /Automated and Mixed. As shown in table 4-13, of the 9 banks, 6

banks (66.7%) are using mixed systems for AIS, 3 banks (33.3%) are using computerised / automated systems for using AIS and there are no banks using manual systems in AIS.

Table 4-13 Distribution of AIS – Kind of Systems are using for AIS

Kind of Systems	Frequency	Percent
1. Manual	0	0%
2. Computerised /Automated	6	66.7%
3. Mixed	3	33.3%
Total	9	100 %

- **Distribution of AIS - The age of the AIS**

Table 4-14 shows that the age of the AIS, in 4 of the 9 (44.5%) banks for more than 10 years. 2 (22.2%) banks have AIS between 5 and 10 years old. Similarly, 2 banks (22.2%) have AIS less than 5 years old. One bank (11.1%) has not written or specific AIS.

Table 4-14 Distribution of AIS – The age of AIS

Age of the system	Frequency	Percent
1. More than 10 years	4	44.5%
2. From 5 to 10 years	2	22.2%
3. Less than 5 years	2	22.2%
Has not written or specific AIS	1	11.1%
Total	9	100 %

- **Distribution of AIS – Software used for AIS**

Interviewees were asked to define the software that their banks used for AIS, regarding the following software: Packaged software, Bespoke/in-house developed and Personal computer spreadsheets or databases. As shown in table 4-15, all banks (100%) are using packaged software.

Table 4-15 Distribution of AIS – Software used for AIS

Type of the software	Frequency	Percent
1. Packaged software	9	100%
2. Bespoke/in-house developed	0	0%
3. Personal computer spreadsheets or databases	0	0%
Total	9	100 %

- **Distribution of AIS – The basic IT used to run the AIS:**

According to the basic IT used to run the AIS, as can be seen in table 4-16, of the 9 banks, the majority of banks (77.8%) are using mainframe computers with a terminal and mini-computers linked by a local area network. All banks (100%) are using personal computers linked to the network as the hardware implementation of the basic IT.

One bank (11.11%) is using wide area network linking different sites which is the Commerce and Development Bank. However, on the other hand the wide area network is being established in the other banks. There was limited utilisation in 7 banks (77.8%) were used ATMs for cash provision. The majority of banks (66.7%) have a website in the WWW except 3 banks (33.3%) which are Alwaha Bank, National Banking Corporation and Aman Bank for Commerce and Investment. In addition, some banks (44.5%) were used mobile banking services.

Table 4-16 Distribution of AIS – The basic IT used to run the AIS

The basic IT used to run the AIS	Frequency	Percent
1. mainframe computer with terminal	7	77.8%
2. mini-computers linked by LAN	7	77.8%
3. stand alone personal computers linked by LAN	9	100%
4. wide area network linking different sites	1	11.1%
5. ATMs for cash dispense	7	77.8%
6. website in the WWW	6	66.7%
7. Mobile banking services	4	44.5%

- **Distribution of AIS – business functions or processes undertaken by AIS**

- Regarding the provision of information, as can be seen in table 4-17, of the 9 banks, 4 banks (44.4%) presented information in the form of paper reports, 1 bank (11.2%) displayed information on a computer screen and 4 banks (44.4%) presented information in the form of paper reports and displayed information on a computer screen.

Table 4-17 Distribution of AIS - Providing information

Providing information	Frequency	Percent
1. presented in the form of paper reports	4	44.4%
2. displayed information on a computer screen	1	11.2%
3. 1 & 2	4	44.4%
Total	9	100 %

- In all banks (100%), the AIS has a customer database, a general ledger and a subsidiary ledger, and provides profit and loss reporting and financial statements.
- As regards electronic funds transfer, just 2 banks (22.2%) execute inward electronic funds transfer within Libya. On the other hand, all the banks execute outward foreign transfers through the SWIFT international network (refer to the basic IT used to run the AIS above).

- Regarding managerial reports, of the 9 banks, 7 banks (77.8%) produce budgets and 8 banks (88.9%) provide performance reports from AIS.
- Regarding updating of the data stored, banks were grouped into two groups: Real time updating and batch transfer. Table 4-18 shows, of the 9 banks, 2 banks (22.2%) update the data in real time and 7 banks (77.8%) use batch transfer.

Table 4-18 Distribution of AIS - Updating of the data stored

Updating of the data stored	Frequency	Percent
1.Real time	2	22.2%
2.Batch transfer	7	77.8%
Total	9	100 %

- As for internal control considerations, the large majority of banks (88.9%) designed adequate documentation, 5 banks (55.6%) have adequately written descriptions of task procedures and other banks use oral description of task procedures.

Concerning segregation of duties, the operation of AIS in all banks (100%) involves the segregation of duties, specifically, authorizing transactions, recording transactions and maintaining custody of assets.

- **Distribution of AIS – the priority of data quality issue**

Interviewees were asked about the priority of data quality in their AIS. The majority of them (88.9%) indicated that the data quality issue is a top priority in their AIS.

- **Distribution of AIS – kind of training in AIS**

Interviewees were required to provide information about the kind of training they have in AIS. Of the 9 banks, 4 banks (44.4%) have both initial training for new employees and occasional, ad hoc, training, 2 banks have just occasional training, and on the other hand, no bank undertakes regular training programme in AIS.

- **Distribution of AIS – additional investment in AIS**

Interviewees were required to answer questions about the proportion of additional investment in AIS in computers, software, hardware, training and up-skilling in the last five years. Of the 9 banks, 7 interviewees answered this question. As can be seen in table 4-19, in all banks, from 50% to 90% of investment in AIS was in hardware and software. On the other hand, in all banks, from 5% to 50% of investment was in training and up-skilling. However, there was 1 bank that has an equal proportion of investment in these components.

Table 4-19 Distribution of AIS – additional investment in AIS

Investment in AIS	Bank 1	Bank 2	Bank 3	Bank 4	Bank 5	Bank 6	Bank 7	Bank 8	Bank 9
1- Hardware	40%	50%	0	0	50%	35%	60%	25%	60%
2- Software	50%	30%	0	0	0%	35%	30%	25%	30%
3- Training	5%	10%	0	0	25%	15%	5%	25%	5%
4- Upskilling	5%	10%	0	0	25%	15%	5%	25%	5%
	100%	100%	0	0	100%	100%	100%	100%	100%

- **Distribution of AIS – satisfaction with bank's AIS**

In this section, interviewees were required to provide information about their overall satisfaction with their banks' AIS. Table 4-20 shows that of 9 interviewees, there were 6 interviewees satisfied with their banks' AIS, 2 interviewees were fairly unsatisfied and 1 interviewee was completely dissatisfied.

Table 4-20 Distribution of AIS – Satisfaction with bank's AIS

The satisfaction with bank's AIS	Frequency	Percent
Completely dissatisfied	1	11.1%
Fairly dissatisfied	2	22.2%
Neutral	0	0%
Satisfied	6	66.7%
Very satisfied	0	0%
Total	9	100 %

- **Distribution of AIS - Assessment of the standard of components in the operation of the AIS**

The interviewees were required to assess the standard of the components (people, procedures, data, software and hardware) in the operation of the AIS in their banks. A five score answers scale was used, with very low and very high.

Table 4-21 shows that of 9 interviewees, in all the banks the hardware was the highest assessment (77.8%) and the lowest assessment was people (11.1%), which verifies the proportion of investment in AIS that is indicated in additional investment in AIS section above. The ranking may reflect the high level of assessment given to components of the AIS by the different commercial banks, because these components contain the investment in AIS needed to know their impact on business performance, which will be examined in the next stage of study.

Table 4-21 Distribution of AIS – Assessment the components of the AIS

Components in the operation of the AIS:	(1) Very low		(2) Low		(3) Natural		(4) High		(5) Very high		Freq	Total Percent	(4) + (5) %
	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%			
1. Hardware	0	0	1	11.1	1	11.1	6	66.7	1	11.1	9	100%	77.8
2. Software	1	11.1	1	11.1	3	33.3	4	44.5	0	0	9	100%	44.5
3. Data	0	0	1	11.1	5	55.6	3	33.3	0	0	9	100%	33.3
4. Procedures	1	11.1	1	11.1	5	55.6	2	22.2	0	0	9	100%	22.2
5. People	3	33.3	2	22.3	3	33.3	1	11.1	0	0	9	100%	11.1

- **Distribution of AIS – An executive level to plan and oversee the IS function:**

As shown in table 4-22, most Libyan commercial banks (55.6%) have an executive level (steering committee) to plan and oversee the IS function. In addition, these committees consist of high - level management level.

Table 4-22 Distribution of AIS – An executive-level (steering committee)

An executive-level	Frequency	Percent
1. There is an executive level	5	55.6%
2. There is no an executive level	4	44.4%
Total	9	100 %

- **Distribution of AIS – Long-range planning to develop AIS**

Interviewees were asked about long-range planning to develop AIS in their banks. Table 4-23 shows that of 9 banks, 5 interviewees (55.6%) answered "Yes" and 4 interviewees (44.4) answered "No".

Table 4-23 Distribution of AIS – Long-range planning to develop AIS

long-range planning	Frequency	Percent
1. There is a long-range planning	5	55.6%
2. There is no a long-range planning	4	44.4%
Total	9	100

In addition, according to table 4-23, three questions should be taken into account when drawing up the plan. What the system will consist of. How it will be developed and by whom. How the needed resources will be acquired (Romney and Steinbart, 2003). The table 4-24 shows that of 5 banks which have long- range planning to develop AIS, 4 banks take all the questions into account and 1 bank takes all the questions into account except how the needed resources will be acquired?

Table 4-24 Distribution of AIS – Drawing up the plan to develop AIS

Drawing up the plan	Frequency		Percent		Total	
	Yes	No	Yes	No		
1. What the system will consist of	5	4	55.6%	44.4	9	100%
2. How it will be developed, and by whom	5	4	55.6%	44.4%	9	100%
3. How the needed resources will be acquired	4	5	44.4%	55.6%	9	100%

4.3 Summary

The number of banks that were visited is nine commercial banks, (Wahda Bank, Commerce and Development Bank, Alejmaa Alarabi Bank, Gumhouria Bank, Sahara Bank, Aman Bank for Commerce and Investment, National Banking Corporation, Alwaha Bank, and National Commercial Bank)

Table 2-25 shows some of the variables that are investigated in the explorative study, and gives the overall picture in three selected banks as a sample of Libyan commercial banks. The three banks represent Libyan banks in terms of ownership of banks, where some Libyan banks (about 50%) are private and other banks state-owned about (50%). No Libyan bank (100%) undertakes regular training programme in AIS. The majority of Libyan banks (90%), investment in training and up-skilling as a percentage of total IT investment was between 10% and 20%. 78% of Libyan banks are updating data stored by batch transfer at the end of the working day, 22% of banks are updating data stored at real time of the end of any banking process. Satisfactions with bank's AIS are distributed between satisfied and dissatisfied.

Table 4-25 Key investigated variables

Name of bank	Commercial and Development Bank	Wahda Bank	Alejmaa Alarabi Bank
Ownership of Banks	Private	State-owned	Private
Updating of the data stored	Real time	Batch transfer	Batch transfer
Investment in training and upskilling	10%	20%	10%
Kind of training	Occasional	Occasional	Occasional
Overall satisfaction with AIS	Satisfied	Completely dissatisfied	Dissatisfied
Date of Establishment	1996	1970	2003

After this screening investigation, The number of banks that will be appropriate for inclusion for the main data gathering phase has been determined, which are Commerce and Development Bank, Wahda Bank and Alejmaa Alarabi Bank for the following reasons:-

1. According to the above discussion, the banks have been selected are representing Libyan banks in most of the key themes.
2. Similar conditions and environment that the Libyan commercial banks deal with, where all banks are operating under the same laws, which are governing the banking business and under supervision and control of the central bank of Libya.
3. Degree of access available and factors of time and cost. The banks which have been selected have higher degree of access than other banks due to the researcher having a relationship and prior dealings with these banks, as well as, their proximity to the researcher's residence.
4. The banks which have been selected are different in terms of size and date of establishment as shown in the table 4-24 above. This will contribute to a generalisation of the results to the study population.
5. There is some uncertainty concerning the future of modern banks and small banks in terms of their incorporation with other small banks due to the lack of capital which is required by the BCL, as mentioned in the interview with the deputy manger of monetary and banking supervision department at the BCL.
6. Time is very important factor in terms of investment in IT and performance, Weill and Olson (1988) suggested that "investment and performance be measured for five years to allow for lag effects", for that reason, banks which were established up to five years will not be selected.

Chapter 5:
Research Findings

Chapter 5 : Research Findings

5.1 Introduction

Chapter 3 described the case study method deployed for the data collection stage of this research. This chapter includes the analysis and interpretation of data gathered from this study. Three case studies were carried out as described in Chapter 3. Each case in this chapter is examined as a whole to obtain an understanding of the opinions and perspectives of the respondents from each individual bank. The interview questions were divided into three main parts as depicted in Figure 3.4: firstly, the extent and nature of AIS investment in Libyan commercial banks; secondly, the investment in AIS and its role in significant change in business processes and in improving business performance in Libyan commercial banks; finally, the importance of training and up-skilling the workforce to make sure the benefits of investment are delivered. There are six sections in this chapter, as shown in Figure 5-1. In the next section, that is Section 5.2, a brief outline of all the cases is given, and then the details of the case study respondents are summarised in Section 5.3. The data collected by interviews and main business functions and IS profiling for each case are discussed in Section 5.4.

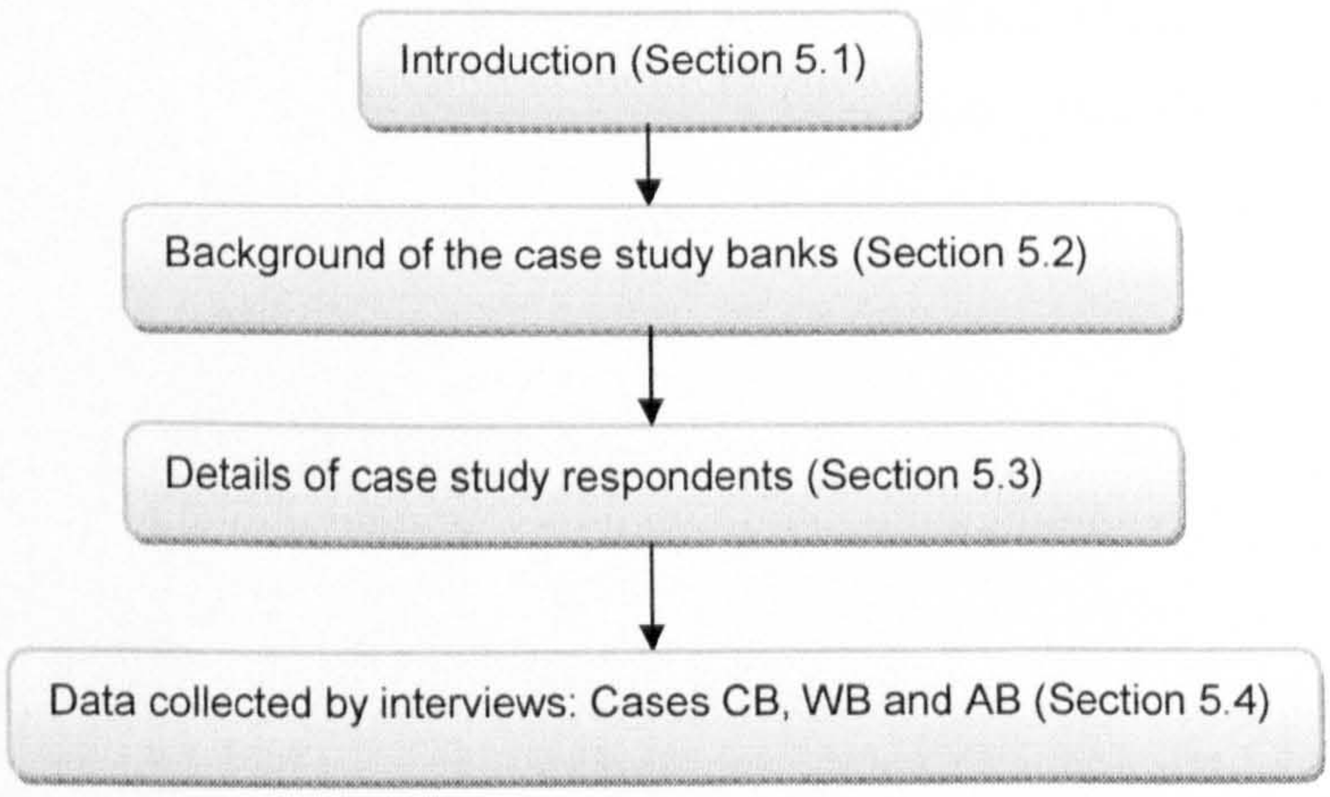


Figure 5-1 Chapter structure with section numbers in brackets

5.2 Background of the case study banks

As discussed and justified in Chapter 3, three Libyan banks were selected for the case study in this research. The case study interviews were carried out between October 2009 and January 2010. The targeted population includes pertinent bank personnel in three major Libyan commercial banks; these are the Commerce and Development Bank (CDB), the Wahda Bank (WB), and the Alejmaa Alarabi Bank (AAB).

Table 5-1 provides an overview of the three case banks. It includes a description of each bank, the number of employees, the annual revenue, total assets, established data, and the period when interviews were conducted.

Table 5-1 Overview of case study banks

Case	Ownership	Date established	Annual revenue (in M. LYD)*	Total assets (in M. LYD)*	Capital (in M. LYD)*	Interview period	Number of employees
Commercial and Development Bank (CDB)	100% private	1996	80.7	2185.5	50	Oct 2009	693
Wahda Bank (WB)	54.1% public 45.9 % private	1970	258.7	8349.5	108	Oct and Nov 2009	3095
Alejmaa Alarabi Bank (AAB)	100% private	2003	15.4	326.8	35	Nov and Dec 2009	305

* 1 LD= £0.51, (31/12/2009)

Source: Economic report for the fourth quarter of 2009, CBL and Income statement and balance sheet of CBL on 31/12/2009.

5.3 Details of case study respondents

As mentioned in chapter 3, 15 interviews were conducted between October 2009 and January 2010. Each interview included 26 questions and took, on average, 60 minutes. All fifteen participants in this research provided a valuable and interesting insight for this research project. Table 5-2 below provides details of the case study respondents in the three banks.

Table 5-2 Summary of case study respondents

Interviewees	Position	Qualification	Academic Background	Banking Experience (years)
Commerce and development Bank (CDB)				
Mr. Waseem El-zawey (CDB1)	Manager of Administrative Affairs Management	Bachelor	Business Administration	13
Mr. Khalid Derbee (CDB2)	Director General	Bachelor	Business Administration	33
Mr. Idrees Al-Tashany (CDB3)	Manager of Accounting Management	Bachelor	Business Administration	30
Mr. Mohammed Al-Jhany (CDB4)	Manager of Operations Management	Bachelor	Accounting	35
Mr. Ahmed Zaid (CDB5)	Manager of Information Technology	Bachelor	Computer Science	3
Wahda Bank (WB)				
Mr. Khaled Alshekhi (WB1)	Manager of Applications	Bachelor	Computer Science	19
Mr. Ahmed Rashid (WB2)	Manager of Accounting Management	Bachelor	Accounting	37
Dr. Najuib Barasi (WB3)	Head of Credit Management	PhD	Accounting	32
Dr. Idris lahaimer (WB4)	Head of Risk Management	PhD	Accounting	3
Mr. Mari Barasi (WB5)	Head of Budget Department	Bachelor	Accounting	10
Alegmaa Alarabi Bank (AAB)				
Miss. Fawzia Adali (AAB1)	Manager of Accounting Management	Bachelor	Accounting	11
Mr. Waleed Altapoli (AAB2)	Manager of Information Technology	Higher Diploma	Computer Science	4
Mr. Hendawi Amenefi (AAB3)	Manager of Operations Management	Bachelor	Accounting	30
Mr. Salah Algrare (AAB4)	Director General	Bachelor	Accounting	12
Mr. Abdulla Soudeq (AAB5)	Manager of Internal Audit Management	Bachelor	Accounting	39

5.4 The Data Collected by Interviews: Cases CDB, WB and AAB

This section describes the data collected by interviews. Semi structured interviews were used to gather data concerning the three 3 research questions depicted in Figure.4.

5.4.1 Case 1: Commerce and Development Bank (CDB)

5.4.1.1 Extent and Nature of AIS Investment at the CDB

The current AIS in the CDB was installed in 2004. This is a large integrated software package from the MISYS software company based in the UK. However, as this system has high capacities and is very developed, the bank does not use all its capacity. In addition, in 2008 all branches and agencies became connected through a fibre optic network. This feature enabled customers to conduct their banking transactions in any branch and agency regardless of where the account was located. In addition, there are secondary systems, such as an electronic banking system and a mobile banking system, which were designed by local companies. All interviewees said that there was full computerisation of the accounting system in the bank.

According to the bank's balance sheet on 31/12/2009, the total value of information technology assets was LYD 4,437 m ($3.5m), which represents more than 10% of the fixed assets and about 0.2% of the total assets. The figure on 31/12/2008 was LYD 1,880 m ($1.5m), which represented about 5.5% of the fixed assets and about 0.1% of the total assets. The increase followed new investment in networking linkage in the branches, secondary or associated systems and Microsoft programmes. However, there were no expenses for training and up-skilling programmes on the MISYS system. According to Libyan Tax Law, the allowed depreciation of these kinds of assets is 20% every year.

Table 5-3 The nature and attributes of AIS in the CDB

Age of Current AIS	1 to 5 years	5 to 10 years	Over 10 years
Interviewees Number		5	
Designer of the system	Local designer	Foreign designer	Mixed
Interviewees Number		4	1
Implemented technology	Advanced	Average	Elementary
Interviewees Number	5		
Computerisation of AIS	Computerised	Mixed	Manual
Interviewees Number	5		

The bank competes at the cutting edge of innovation through the use of information technology as a competitive weapon, and views information technology as a critical and essential investment area (see Table 5-4). Owing to the fact that the bank works among banks that have greater capital and have more banking experience, the management of the bank keeps pace with new development in the area of IT and tries to apply them in Libya; therefore, the bank is differentiated from other banks in this area, where in 2004, the CDB was the first bank in Libya to issue Visa card, and use ATMs, points of sale, electronic banks and mobile banks (interviewee 1, p.241). In addition, in 2008 all branches and agencies became connected through a fibre optic network.

Table 5-4 CDB's use of Information Technology

Statement	Yes	No
Competition at the cutting edge of innovation	5	
Use IT as a competitive weapon	5	
View IT as a critical and essential investment area	5	

The MISYS system provides the required information to all internal and external users and to all levels of the management and operational reports on business transactions for operatives and controllers in an easy and accessible way. Moreover, board members every day receive reports of the financial situation and daily activities of the bank and its branches (see Table 5-5).

Table 5-5 Information generated by the accounting system at CDB

Types of information	Yes	No
Financial statement for external users	5	
Managerial reports for internal users	5	
Operational reports on business transactions	5	
Statistical reports	5	
Top line information (EIS)	5	
Information for board members (DSS)	5	

The most important problems and obstacles that arose during the operation of AIS are related to human resources in terms of a lack of qualified and skilled staff. These problems have three main causes: lack of specialists and qualified staff in technology, lack of training and up-skilling and difficulties caused by MYSIS being an overseas system with no branch in Libya. The second most important problem was the lack of communications

between Libyan banks, which was caused by a lack of communications infrastructure in the country.

Regarding the maintenance and support of the system, there were problems in maintaining and supporting the system, and the bank copes with this problem by hiring experts from outside the bank. These problems were the result of two key issues: there are no specialists in technology in the field of accounting in the bank and there is lack of training on the system. Moreover all Libyan banks face the same problems and these problems are related to the human element and technical factors (see Table 5-6).

Table 5-6 The most important problems and obstacles at CDB

Problems and Obstacles	CDB1	CDB2	CDB3	CDB4	CDB5
Kinds of problems and obstacles	Lack of qualified staff and lack of communications	Educational level of the staff and lack of communications	Lack of qualified and skilled staff	Lack of training on the system	Lack of communications and operation, maintenance and support of the system
Maintenance and support for the system	Hiring experts from outside the bank				some problems in operation, maintenance and support the system
Reasons of these problems	No specialists in technology staff and lack of communications infrastructure in the country	lack of qualified staff and training, and lack of communications infrastructure in the country	Lack of efficient staff	MYSIS being an overseas system	Lack of training and up-skilling and communications infrastructure in the country
Exclusive to the bank or all Libyan bank	All Libyan banks	All Libyan banks	All Libyan banks	All Libyan banks	All Libyan banks
Related to human or technical factors	Human element and technical factors	Human element and technical factors	Human element	Human element	Human element and technical factors

The MISYS system was easy to use and uncomplicated in that all banking operations were available in the system to all users. However, the system needed qualified staff and some training. On the other hand, the system was not easy in that it was very advanced in terms of support and maintenance and it needed highly qualified and skilled staff (see Table 5-7).

Table 5-7 Ease and simplicity of use of the system

Respondents	Yes	No	Why?
CDB1	√		It is easy and simply available to all and just needs some training.
CDB2	√		All banking operations are available in the system and it just needs a qualified person.
CDB3	√		It just needs training to follow the correct procedures.
CDB4		√	Very advanced and needs time and training.
CDB5		√	It is difficult in terms of support and maintenance as a result; the evolution of the system requires highly qualified and skilled staff.

With reference to the main business area of the bank that IT projects were being used for, Table 5-8 shows that all main banking business activities were covered by IT projects. However, some transactions need to be manually entered at the beginning of procedure such as documentary credits.

Table 5-8 Main banking business area

Respondents	Main areas of business
CDB1	All main areas of business in the bank have been covered by IT projects.
CDB2	All main areas of banking business have been covered by IT projects.
CDB3	All main areas of banking business have been covered by IT projects.
CDB4	All banking business activities have been covered by IT projects.
CDB5	All banking business activities have been covered by IT projects.

Table 5-9 shows users of the information and how often they used it. 'Bank's top executives/board members used the information most frequently' (Rank 1), followed by 'managers in the bank' (Rank 2). On the other hand, two respondents said that 'government bodies rarely used the information' (Rank7).

Table 5-9 Users of the information generated by the AIS

Users	Yes	No	Frequency of the rank							Rank in total	
			1	2	3	4	5	6	7	*Average	Rank
Bank top executives/Board members	5		4		1					1.40	1
Managers in your bank	5			4			1			2.60	2
Operatives, controllers, office staff	5				3	1		1		3.80	3
Shareholders	4	1			1	2		1		4.25	4
Tax department in the finance ministry	5		1				2	1	1	4.80	5
Investors and creditors	5					2	2		1	5.00	6
Governmental bodies	4	1		1				1	2	5.50	7

*to rank the users, the frequency of the rank was given weight as following: Σ FR x R / RN, where FR= Frequency of the rank, R= Rank and RN= number of Respondents.

5.4.1.2 Investment in AIS, Business Processes and Business Performance at the CDB

The MISYS system as an efficient and effective system, Table 5-10 shows that the important benefits that could be gained from the efficient deployment of the AIS were as follows:

- Accurate information was available on time and easily to all internal and external users.
- Time and effort were saved.
- The quality of the data was ensured.
- Any new activities were accommodated.

However, there were obstacles which kept the bank from being more effective in its use of the AIS, which can be summarised as follows:

- Lack of qualified staff in terms of skill and qualifications.
- Lack of culture of customers to use technological services because there is no good services marketing.
- Lack of training and up-skilling of the employees.

It is noted that the first and third obstacles are the same as those mentioned in the first section, which arise during the operation of the AIS.

Regarding the assessment of the cost and benefits of the AIS, the AIS's benefits outweigh its cost, and there was substantial saving through the use of IT, especially in the long term. With reference to the availability of the information, the system provides required information to internal users constantly, and provides monthly and quarterly information to external users on time.

Table 5-10 Assessment of the effectiveness and the efficiency of the AIS

Statement	CDB1	CDB2	CDB3	CDB4	CDB5
The important benefits that may be gained from efficient deployment of AIS	Accurate information is available on time to all internal and external users.	Saving time and effort	Ensuring the quality of the data.	Providing required information in time and saving time and effort.	Ensuring the quality of data, it accommodates any new activities and providing information easily to all users
The obstacles that keep the AIS from being more effective	Human element	Lack of staff's efficiency.	There are no any obstacles.		Lack of culture of customers to use technological services and a lack of training and up-skilling.
Evaluate cost /benefit of the AIS	The AIS's benefits outweigh its costs.	There is substantial saving by the use of IT.	Benefits from the system are greater than its cost.	The cost is high but there are great benefits obtained.	
the availability of information to all users (internal/ external)	Available on time to all internal and external users.	Required information is available on time to internal and external users.	Providing information to internal users constantly and to external users monthly and quarterly.	Providing information to all users.	

Investment in AIS has a positive influence on the bank's reputation. Table 5-11 summarises this influence through answers of respondents as follows; increasing bank's customer numbers and income, creation of new services and improving extant services, obtaining a good reputation for the bank and strengthen bank's competitiveness among other banks.

Table 5-11 Influence of investment in AIS on the bank's reputation

Respondents	Influences
CDB1	Customer numbers have, income has increased, and the reputation for the bank has improved.
CDB2	The bank's reputation has been improved, which increases interest of customers to deal with the bank
CDB3	A positive influence on the bank's reputation and strengthen its competitiveness among other banks
CDB4	A positive impact on the bank's reputation, creation new services and increases number of customers and income
CDB5	It has led to an increase in the reputation of the bank

The current AIS is very effective in supporting managers in decision-making and problem solving, because one of the main targets when obtaining this system was supporting and

improving decision-making. However, the system should include personal information about customers to support more accurate decision-making (see Table 5-12).

Table 5-12 Effectiveness of AIS in supporting managers in decision making and problem solving

Respondents	Effectiveness
CDB1	The system is very effective in supporting managers for decision-making
CDB2	The system is very useful in supporting managers to make decisions and solve problems
CDB3	The system is effective to the maximum extent in support of decision making
CDB4	The system is effective, it makes decision-making faster and more accurate
CDB5	The system is very effective in supporting managers

Regarding the need to develop the AIS in response to development and changes in the Libyan business environment, especially regarding the NPS project. Table 5-13 summarises respondents' answers as follows; compared with other Libyan banks, the bank was using a developed system and the linkage between all bank branches and agencies has been completed, so there was no need to develop the system further with regard to the developments in the Libyan business environment. In addition, the system was compatible with changes and developments in the Libyan business environment. In terms of the NPS project, the bank was connected with some elements of the NPS and with some Libyan banks, for example, the real time gross settlement system (RTGS) and the automated clearing house (ACH). The bank was waiting for other banks to connect with them through the NPS project.

Table 5-13 Need to further develop AIS in CDB

Respondents	Need to develop
CDB1	There is no need, the Bank is advanced in its use of IT
CDB2	The bank is connected with some elements of the NPS
CDB3	The system is compatible with the changes and developments in the Libyan business environment
CDB4	The bank is ready to deal with the NPS project
CDB5	the bank ready now; we are just waiting for other banks to connect with them through NPS

In the CDB, IT has an essential role in competing with other banks, whereby the bank is faced with the largest banks in terms of capital and age, therefore the bank relies on IT as a key component of business strategy in competition with other banks, because most services are similar in all Libyan banks but IT makes a difference in the means of providing these services. This leads to an increase in customers' numbers and provision of new and fast services, thereby increasing of the bank's revenues. The bank's current reputation was reliant upon the use of advanced IT (see Table 5-14).

Table 5-14 Role of AIS in gaining competitive advantage

Respondents	Role of IT
CDB1	An essential part to play in competition which the bank has faced with the largest banks in terms of capital and age.
CDB2	A great role to play in competition. These led us to obtain new customers for the bank and to maintain existing customers.
CDB3	A major role. The bank's current reputation was caused by using advanced IT.
CDB4	The bank relies on IT as a strategy in competition with other banks
CDB5	A key role in competition, most services are similar in all Libyan banks, but IT makes a difference in the way of providing these services

The role of AIS in developing business performance can be summarised through the following points:

- It has simplified and reduced procedures.
- It has reduced costs and time.
- It has provided accurate and timely required information.
- It has supported decision-making and problem solving.
- It has provided new services and improved existent services.
- It has improved the speed and accuracy of transactions.

In addition, the deployment of AIS in the bank was sufficient to improve business performance. In addition, by training and improving the skilling of the workforce the AIS will be more able to improve business performance (see Table 5-15).

Table 5-15 Role of AIS in improving business performance

Respondents	Role of AIS	
	Level of AIS is sufficient to improve business performance	**If it is not sufficient, how can it be improved?**
CDB1	Through providing accurate and timely information and improving the speed and accuracy of transactions.	By training and up skilling the workforce.
CDB2	Through providing accurate and timely information. The level of AIS is sufficient.	
CDB3	The level of AIS is sufficient. It has Simplified transaction, reduced costs and time and supported decision-making.	
CDB4	The system is good and sufficient because it results in speed of services delivery and providing information on time as well as reducing procedures.	
CDB5	The system is sufficient by providing new services and improving existing services.	

Regarding the effects of the upgrade in AIS infrastructure on the structure of the workforce and activities in the bank (Table 5-16), these effects can be summarised as

follows; improving employees' performance and banking business performance by reducing the time and cost of transaction completion, and being more accurate and reducing their number, and increasing the accuracy of information, as well as creating new services and improving existing services. These influences have increased income and the number of customers.

Table 5-16 Effects of the upgrade in AIS infrastructure on structure of the workforce and activities

Respondents	Effects
CDB1	Providing new services, improving existing services and the accomplishment of transactions and increasing income and customers
CDB2	Providing a new services, improving existing services and made the accomplishment of transactions more accurate and speed
CDB3	Improving employees' performance and banking business performance and providing new services to the customers
CDB4	Reducing a number and cost of procedures and creating new banking activities
CDB5	Provided new services, increasing accuracy of information, reducing time to complete transactions and errors, improving services and creating new activities

Regarding the impact of the upgrade of AIS infrastructure on banking transaction costs and the number of staff and branches, the banking transaction cost and number of staff have been decreased as a result of the upgrade of IS/IT infrastructure, and this has lead to an increase in income. According to the number of branches, there was no impact on the number of branches, because branch numbers depend on a feasibility study and it is not related to AIS projects, and the large area of the country might have an impact on increasing the number of branches. Whenever the reputation of bank was good, the demand for bank services was increased by customers, therefore the number of branches would be increased.

Table 5-17 shows the factors that driving investment in AIS in the bank and their rank in order of frequency of use. The most important factor was 'to increase and improve customer services' followed by 'increasing internal efficiency'. In the third rank was 'cutting service prices and lowering service costs'. On the other hand, the last two factors were 'increasing efficiency of business transactions' and 'defending current market share position respectively'.

Table 5-17 Factors driving investments in AIS

Factors	Yes	No	Frequency of the rank								Rank in total	
			1	2	3	4	5	6	7	8	*Average	Rank
Improve and increase customer services	5		4		1						1.4	1
Increase internal efficiency	4	1		1	1	1	1				3.5	2
Cut service prices/lower service costs	5			2		1	1	1			3.8	3
Increase understanding of customer needs	4	1		1	1			2			4.25	4
Market share growth (take from competition)	5			1	1		1		2		4.8	5
Create overall market growth (create new demands)	5		1			1	1			2	5.2	6
Increase efficiency of business transactions	5				1	1		1	1	1	5.6	7
Defend current market share position	4	1				1		1	1	1	6.25	8

*to rank the factors, the frequency of the rank was given weight as following: Σ FR x R / RN, where FR= Frequency of the rank, R= Rank and RN= number of Respondents.

The factors listed in the Table 5-18 that contribute to the success of the bank's AIS. The first factor was 'technical skills of IS staff members', and in the second rank was 'supportive bank management and users'. There were two factors in the third rank, which were 'reducing costs and errors' and 'providing quality and innovative services to the customer'. As for 'customer service attitude towards ISs', this was the last factor with eighth rank.

Table 5-18 The factors contributing to the success of bank's AIS

Contributors	Yes	No	Frequency of the rank								Rank in total	
			1	2	3	4	5	6	7	8	*Average	Rank
Technical skills of IS staff members	5		3		1		1				2.2	1
Supporting bank management/users	5			2	1	1		1			3.4	2
Reduce cost and errors	4	1	1	1			1			1	4.0	3
Provide quality and innovative services to the customer	4	1	1	1				1	1		4.0	3
Adequate funding	5				1	3			1		4.4	5
Alignment of IS and business strategies	5			1	1		1		1	1	5.0	6
Partnering with external service provider(s)	4	1			1		1	1		1	5.5	7
Customer service attitude towards ISs	4	1				1		1	1	1	6.25	8

*to rank the contributors, the frequency of the rank was given weight as following: Σ FR x R / RN, where FR= Frequency of the rank, R= Rank and RN= number of Respondents.

The most important benefit of IT and their rank in order of importance is as follows; in the first rank was 'giving the bank a competitive advantage'. The second rank was 'enabling the bank to increase revenues', and 'providing a way for the bank to reduce costs' in the third rank. 'Assisting and supporting the needs of the bank's business was in the fourth rank. In the sixth and last rank was 'playing an integral role in meeting customer requirements'.

Table 5-19 Benefits of IT

Statements	Yes	No	Frequency of the rank						Rank in total	
			1	2	3	4	5	6	*Average	Rank
IT gives your bank a competitive advantage	5		3		2				1.8	1
IT enables your bank to increase revenues	5		2	1	1	1			2.2	2
IT provides a way for your bank to reduce costs	5			3	1		1		2.8	3
IT assists and supports the needs of your bank's business	5			1		2	1	1	4.2	4
IT is an important component and is aligned to your business strategy	5				1		3	1	4.8	5
IT plays an integral role in meeting customer requirements	5					2		3	5.2	6

*to rank the statements, the frequency of the rank was given weight as following: Σ FR x R / RN, where FR= Frequency of the rank, R= Rank and RN= number of Respondents.

The CDB provides all the items listed in Table 5-20 and their rank in terms of availability as follows, in the first rank was 'providing enough funds for on-going investment in AIS', and the second rank was 'technical tools to develop and support AIS', 'providing outside specialist experts when required' was the third rank, and in the fourth and last rank was 'providing skilled personal to implement and support the AIS'.

Table 5-20 Items to implement, support and develop AISs

Items	Yes	No	Frequency of the rank				Rank in total	
			1	2	3	4	*Average	Rank
Enough funds for on-going investment in AIS	5		5				1	1
Technical tools to develop and support AIS	5			5			2	2
Outside specialist experts when required	5				5		3	3
Skilled personal to implement and support the AIS	5					5	4	4

*to rank the items, the frequency of the rank was given weight as following: Σ FR x R / RN, where FR= Frequency of the rank, R= Rank and RN= number of Respondents.

All the benefits listed in the Table 5-21 were achieved, and rank of the evident benefits in terms of respondents agreement as follows; 'IT banking services save their time' and 'provide accurate accounting information' in the first rank and the second rank respectively. There was little difference between 'IT banking services make their banking more convenient' and 'provide privacy in their banking transaction in terms of the rank of respondents', which were the third and fourth respectively. 'Easy to use IT banking services' was the fifth and last rank.

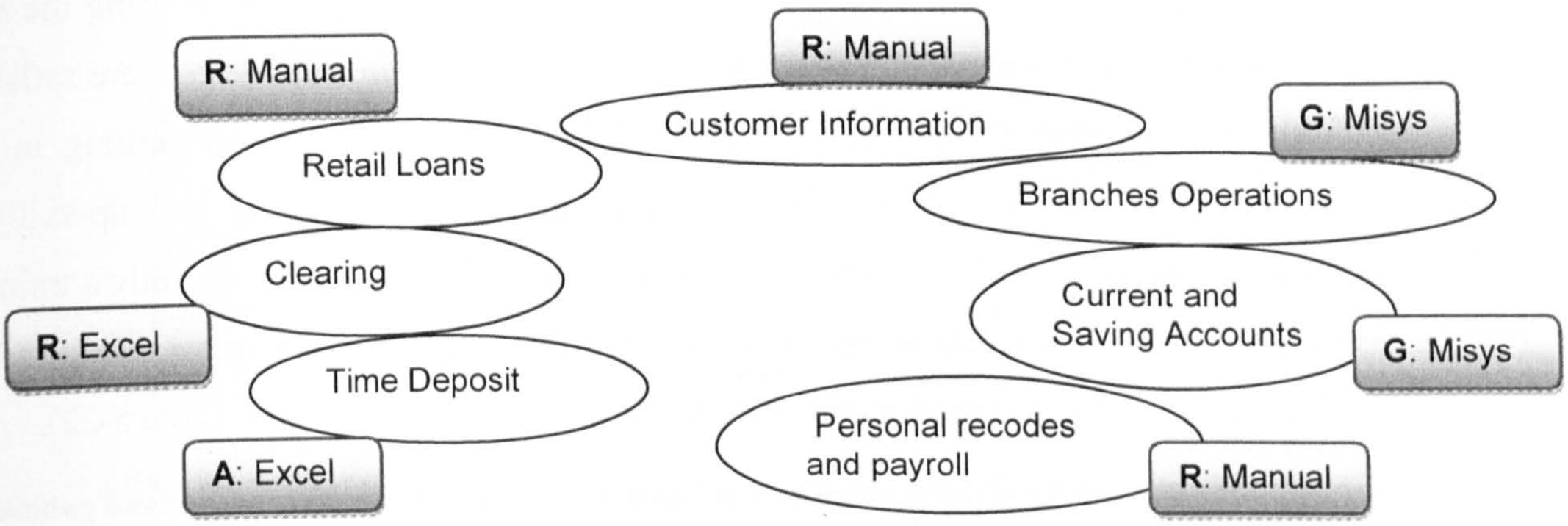
Table 5-21 Benefits of IT banking services achieved

Benefits	Yes	No	Frequency of the rank					Rank in total	
			1	2	3	4	5	*Average	Rank
IT banking services save your time	5		2	2	1			1.8	1
IT banking services provide accurate accounting information	5		1	2	2			2.2	2
IT banking services make your banking more convenient	5		1		1	2	1	3.4	3
IT banking services provide privacy in your banking transaction	5			1	1	2	1	3.6	4
It is easy to use IT banking services	5		1			1	4	5	5

*to rank the benefits, the frequency of the rank was given weight as following: Σ FR x R / RN, where FR= Frequency of the rank, R= Rank and RN= number of Respondents.

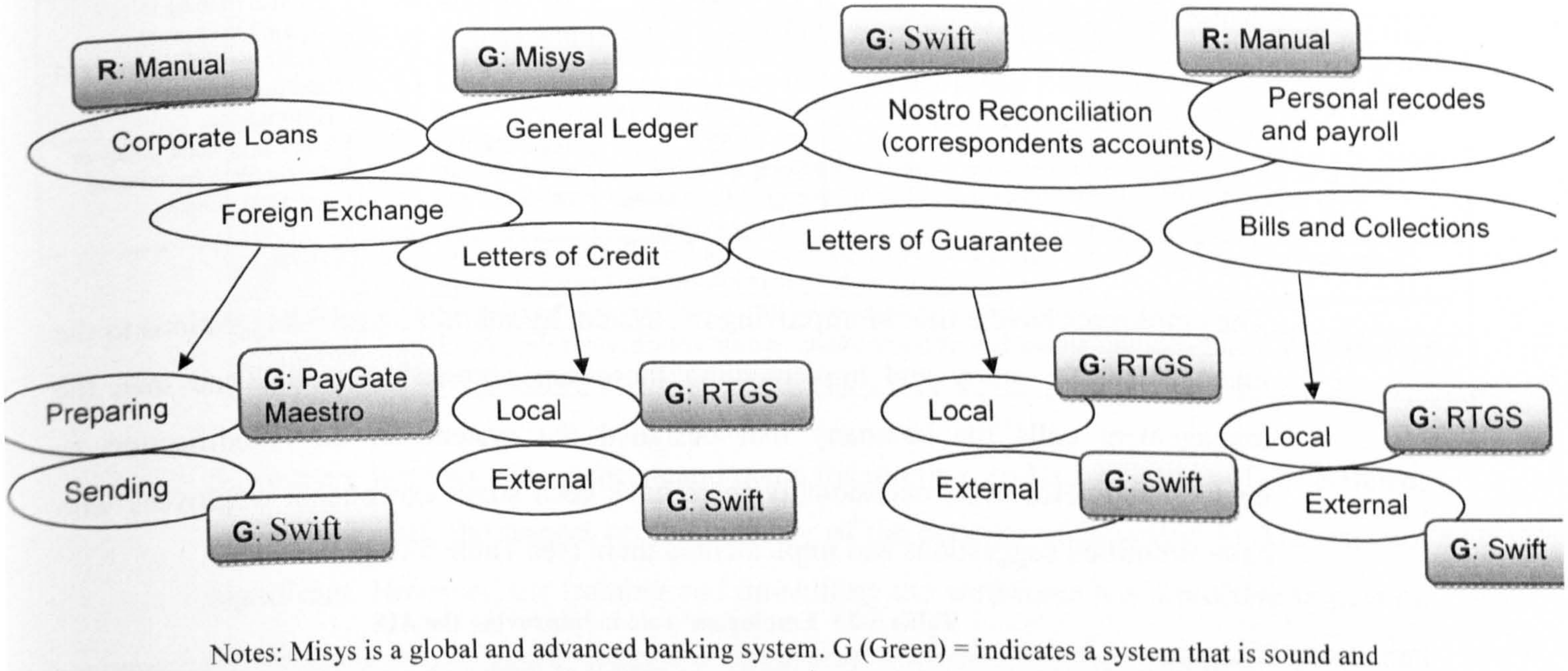
With respect to main business functions and IS profiling at the CDB, according to interviews that were conducted with relevant staff, bank documents and the researcher's observations, the MISYS system is global and advanced. This system covers most business processes and banking financial activities. Moreover, there are other advanced systems, which are Real Time Gross Settlement for local letters of credit and Swift for external letters of credit. These systems do not need replacing, but there is a need for more training and up-skilling of the workforce to raise the benefits of these systems. Also, there are some business processes and banking activities, such as corporate and retail loans and human resources, which are manual and need development. In addition, there are activities which use basic software such as Excel in some business processes, such as time deposit and clearing, and these systems may need replacing by other more advanced systems. Main Business Functions and IS profiling can be divided into two key types of business, which are Retail Business and Corporate Business as described in figures 5-2, 5-3 and 5-4. Retail business related to personal processes of individuals more than business operations, for example, saving and current accounts, social loans, housing loans and other. The Corporate business is related to business operations, whether individuals or companies such as letters of guarantee and letters of credit. The MISYS system is now supporting the major business processes/functions in both the retail and the corporate business, with the notable exception of customer information and personnel records management and payroll which are still either manual or done on simple spreadsheets (Figure 5-2). Nevertheless, questionnaire and interview responses suggest that the MISYS system provides the required information to all internal and external users and to all levels of the management and operational reports on business transactions for operatives and controllers in an easy and accessible way.

- **Retail Business**



Notes: Misys is a global and advanced banking system. G (Green) = indicates a system that is sound and does not need replacing. A (amber) = indicates a system that may need replacement.
R (red) = indicates a system is defective and need replacing.

- **Corporate Business**



Notes: Misys is a global and advanced banking system. G (Green) = indicates a system that is sound and does not need replacing. R (red) = indicates a system is defective and need replacing. **RTGS** (Real Time Gross Settlement)

Figure 5-2 Main Business Functions and IS profiling at the CDB

(Based on systems profiling developed in Wynn et al, 2009)

5.4.1.3 The Importance of Training and Up-skilling the Workforce at the CDB

The employees were trained by the MISYS Company at the beginning of using the new system and by the IT management in the bank. In general, the employees were satisfied with the new system. There was a lack of training programs and up-skilling in IT. Currently, there was no clear policy or plan in place for training and up-skilling. Moreover, there were no training courses for new employees. However, recently a training centre has been established in the bank. In addition, external training was required to improve workforce performance and banking business performance (see Table 5-22).

Table 5-22 Assessment of the training and up-skilling of the workforce programmes and policies

Respondents	Where were the employees trained?	Who trained them?	Are the employees satisfied?	Assessment of programmes and policies
CDB1	In the bank	The MISYS Company and the management of IT	The majority of employees are satisfied	Currently, there is no clear policy or plan in place for training and up-skilling
CDB2	In the bank	The MISYS Company and the management of IT	Fairly satisfied	There is a lack in training programs and up-skilling in IT.
CDB3	In the bank	The management of IT	Satisfied	There is no clear policy or plan in place for training and up-skilling.
CDB4	In the bank	The management of IT	The employees are satisfied	External training is required to improve workforce performance and banking business performance.
CDB5	In the bank	The MISYS Company at the beginning of using the new system.	In general the employees are satisfied.	There is no clear policy or plan in place for training and up-skilling.

The employees have a role in improving the system by submitting their suggestions to the management for study and implementing these suggestions if possible, and then the management calls the company that designed the system for any modification or development. However, occasionally there have been some exceptional employees who have submitted suggestions and implemented them (see Table 5-23).

Table 5-23 Employees' role in improving the AIS

Respondents	Role of employees
CDB1	They have a role to improve the system by submitting their suggestions to the management.
CDB2	They submit suggestions to the management for studying and implementing if possible.
CDB3	They have a role to improve the system by submitting their suggestions to the management.
CDB4	The management of IT receives any suggestion from operators of the system.
CDB5	Occasionally there are some exceptional employees who have submitted suggestions and implemented them.

The training and up-skilling of the workforce was essential to realise the benefits of AIS adequately and satisfactorily (see Table 5-24).

Table 5-24 Need of training and up-skilling of the workforce

Respondents	Extent of need		
	Very required	Neutral	Not required
CDB1	It is very necessary		
CDB2	It is required and essential		
CDB3	It is very necessary		
CDB4	It is very required		
CDB5	It is essential and very important		

The skilled employees in IT were very helpful to improve business performance. Employee skills levels can positively influence business performance through improvement of service and speed up transactions and reduction of errors, thus saving time and effort; it also improves the banking services. In addition, skilled employees in IT have a better performance than others; they save time and effort, provide accurate and timely information, and they deal with the largest number of transactions (see table 5-25).

Table 5-25 Employees' skills in IT

Respondents	Help of employees' skills in IT
CDB1	The skills of employees in IT lead to accuracy and speed of transactions. This will influence the business performance through increasing the number of transactions that are accomplished by the employees.
CDB2	Skilled employees in IT have a better performance than others; they sieve time and effort, and provide accurate and timely information. In addition, they deal with the largest number of transactions.
CDB3	The employees' skills influence positively on business performance through the improvement of service and speed up transactions and reduce errors.
CDB4	Skilled employee in IT is very helpful to improve business performance
CDB5	Employee's skills improve business performance through saving time and effort; it also improves the banking services.

Since there were no clear policies and plans for training, and a lack of qualified, efficient and skilled staff, the impact on the delivery of the benefits of investing in AIS was not significant. However, the training and up-skilling the workforce has a positive impact on the delivery of the benefits of investing in AIS in terms of accuracy of work and completion speed of transactions. Moreover, when the employees have been training and up-skilling well, they can create new services and this has an impact on the business performance. For example, training was essential to ensuring the success of the linkage between the branches of the bank and mobile banking (interviewee 5, p.261).

Table 5-26 Effects of training and up-skilling of the workforce on the benefits delivery of investment in AIS

Respondents	Effects of training and up-skilling
CDB1	Since there are no clear policies and plans for training, its impact on the delivery of the benefits of investing in IT is not significant
CDB2	Due to the lack of proper selection of qualified, efficient and skilled staff, the impact on the delivery of the benefits of investing in IT is not significant
CDB3	Because of there are no policies and plans for training and up-skilling the workforce, so the impacts of the training and up-skilling is not significant
CDB4	The training and up-skilling the workforce has a positive impact on the delivery of the benefits of investing in IT in terms of accuracy of work and completion speed of transactions
CDB5	It has an impact on the business performance, through creation new services

All mentioned benefits in the Table 5-27 are delivered by the training and up-skilling of the workforce. Regarding the most important benefits, 'improve customer services' the first rank, in the second rank was 'raise the capacity to deal with the growth in number of transactions' followed by 'reduce a number of errors' in the third rank. In the fourth rank was 'improving the accounting control in terms of accuracy and recording transactions'. On the other hand, the less important benefits are 'improve working conditions and competition' and 'improve competitive advantage of the bank' at the fifth rank, and in the last and seventh rank was 'reduce the number of employees'.

Table 5-27 Benefits of the training and up-skilling of the workforce

Benefits	Yes	No	Frequency of the rank							Rank in total	
			1	2	3	4	5	6	7	*Average	Rank
Improve customer services	5		3	1	1					1.6	1
Raise the capacity to deal with the growth in number of transactions	5		1	2	1		1			2.2	2
Reduce a number of errors	5		1	1	1		2			3.2	3
Improve the accounting control in terms of accuracy and recording transactions	4	1		1	1	2				3.25	4
Improve working conditions and competition	5				1	1		1	2	5.4	5
Improve competitive advantage of the bank	5					1	2	1	1	5.4	5
Reduce the number of employees	4	1				1		2	1	5.75	7

*to rank the benefits, the frequency of the rank was given weight as following: Σ FR x R / RN, where FR= Frequency of the rank, R= Rank and RN= number of Respondents.

5.5 Comparison of Some Business Processes in the CDB between New and Old Systems

Through the semi-structured interview, participants were asked to Compare between old and new system in some business processes as following:-

- **Networking Linkage**

Before the completion of networking linkage between branches, each branch was separated from other branches, leading to a delay in customers' procedures because some of these procedures required using telephone or fax especially in cases of withdrawal. In addition, customers had to go to their own specific branches for some transactions such as issuance of chequebook. Currently, after completion of linkage, all branches are connected by unified network with the latest scientific methods (optical fibre), which has led to the elimination of the problems mentioned above, and has expedited customer transactions such as withdrawal, deposit and chequebook request, and certified chequebook, which has enabled customers to implement them through any branch without delay.

The linkage also helped the effectiveness of using ATMs and electronic payment cards, which has led to a significant reduction in the number of inefficient transactions, thus reducing number of staff, which has led to a reduction in the time and material costs of banking. Thus, although the MISYS system itself has not been used to significantly advance customer information and management, the advent of network linkage has had a major impact on this process, as depicted in Figure 6.5.

- **Valuation of Foreign Currency**

According to the old system (Figure 5-3), at the end of the year the bank valued the currency manually (gain or loss) and the result was then entered into the system. This led to significant delay in knowing the result of gain or loss from keeping foreign currency, and the valuation process needed a large number of staff and there was significant time delay between the evaluation process and input in the system. In the MISYS system, the valuation is done automatically, where the daily exchange rate of a foreign currency is entered and the gain or loss is transferred to the profit and loss account. This process needs one employee and less than half an hour to do that, it enables also management to know gain or loss from keeping foreign currency at any time during the year with less time and effort. This is one example of how the MISYS system has been used to automate bank

financial management and the increased availability of relevant management reports is also now supporting further process improvement (Figure 6-3)

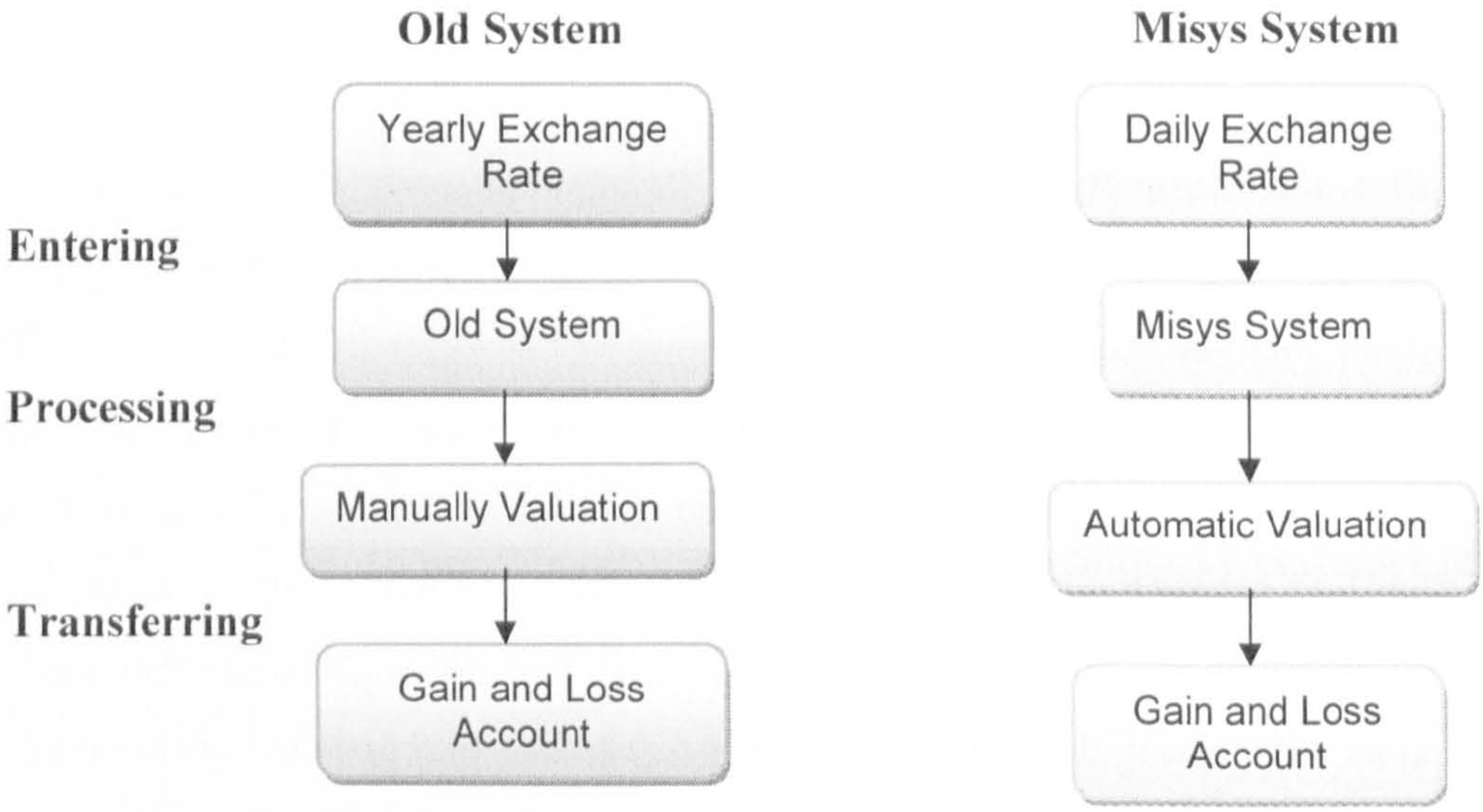


Figure 5-3 Map of foreign currency Valuation Process at CDB

- **Loans**

In the old system, when the customer received a loan, the interest rate would be determined and added to the customer's account, interest was calculated manually and then an entry was done. Every procedure of the previous procedures needs three to four employees and time for each one loan process. In the MISYS system, the interest is calculated automatically and deducted with the loan from the customer's account. In MISYS system, the loan process could be done by one employee in less time, less procedures and cost with more accurate (Figure 5-4). The loans management process is now fully automated (Figure 6-3), but more use needs to be made of MISYS reports. Spreadsheets are still used to provide management information.

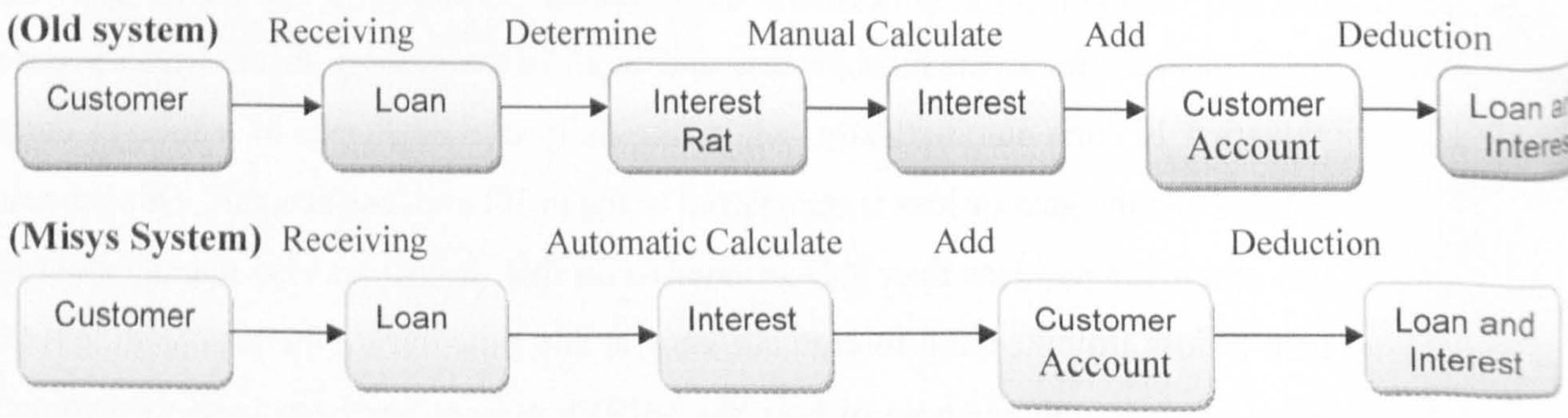


Figure 5-4 Map of Loan Process at CDB

- **Clearing**

In the old system, when a customer deposited a cheque in his account, the cheque was suspended until it was credited at the end of day by an employee if the cheque drawn on the same bank, but if the cheque was drawn on another bank, the cheque needed a few days to be deposited. Suspension of the check resulted in opportunity costs, which is an interest that could have been obtained if the bank had invested this amount during these days. In the MISYS system, now the cheque is credited automatically at the time of deposit without opportunity costs. (Figures 5-5 and 6-3)

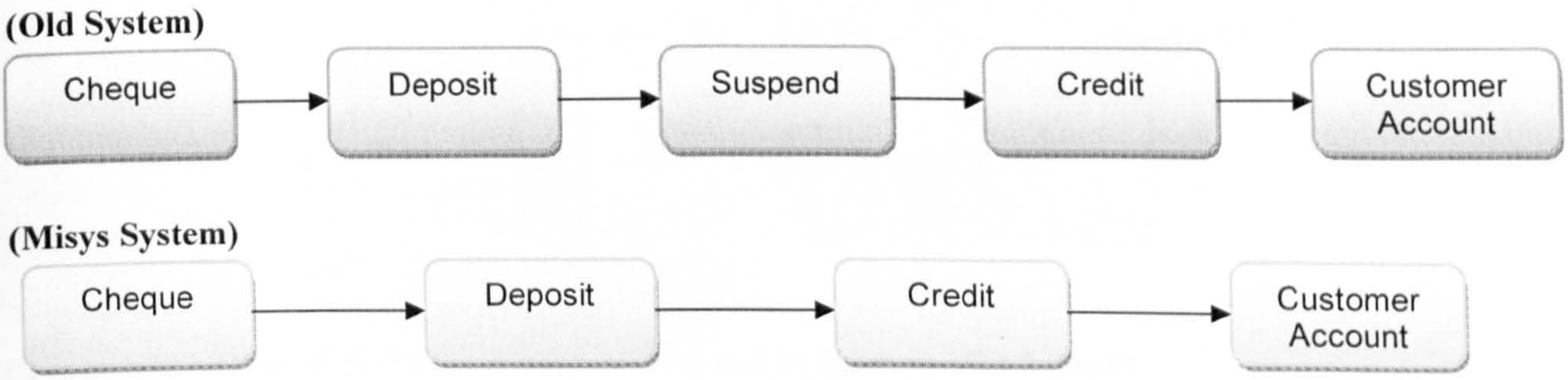


Figure 5-5 Map of Clearing Process at CDB

- **Balance Sheet and Income Statement**

In the old system (Figure 5-6), balance sheet and income statement were prepared annually for the head office and branches separately, and then these were consolidated. Theses process may take few weeks and needed a large number of full-time staff - furthermore there was the cost of overtime. On the contrary, in the MISYS system (Figure 5-7), it is less effort and time to prepare them, where management can request consolidated balance sheets and income statements and it can also request the balance sheet or income statement for each branch separately at any time without more effort or time, because all banking processes are automatically transferred to the right accounts once they are completed, and the linkage network between branches and head office has saved an significant time, effort and cost. This is another example of the automation of bank financial management (Figure 6-3)

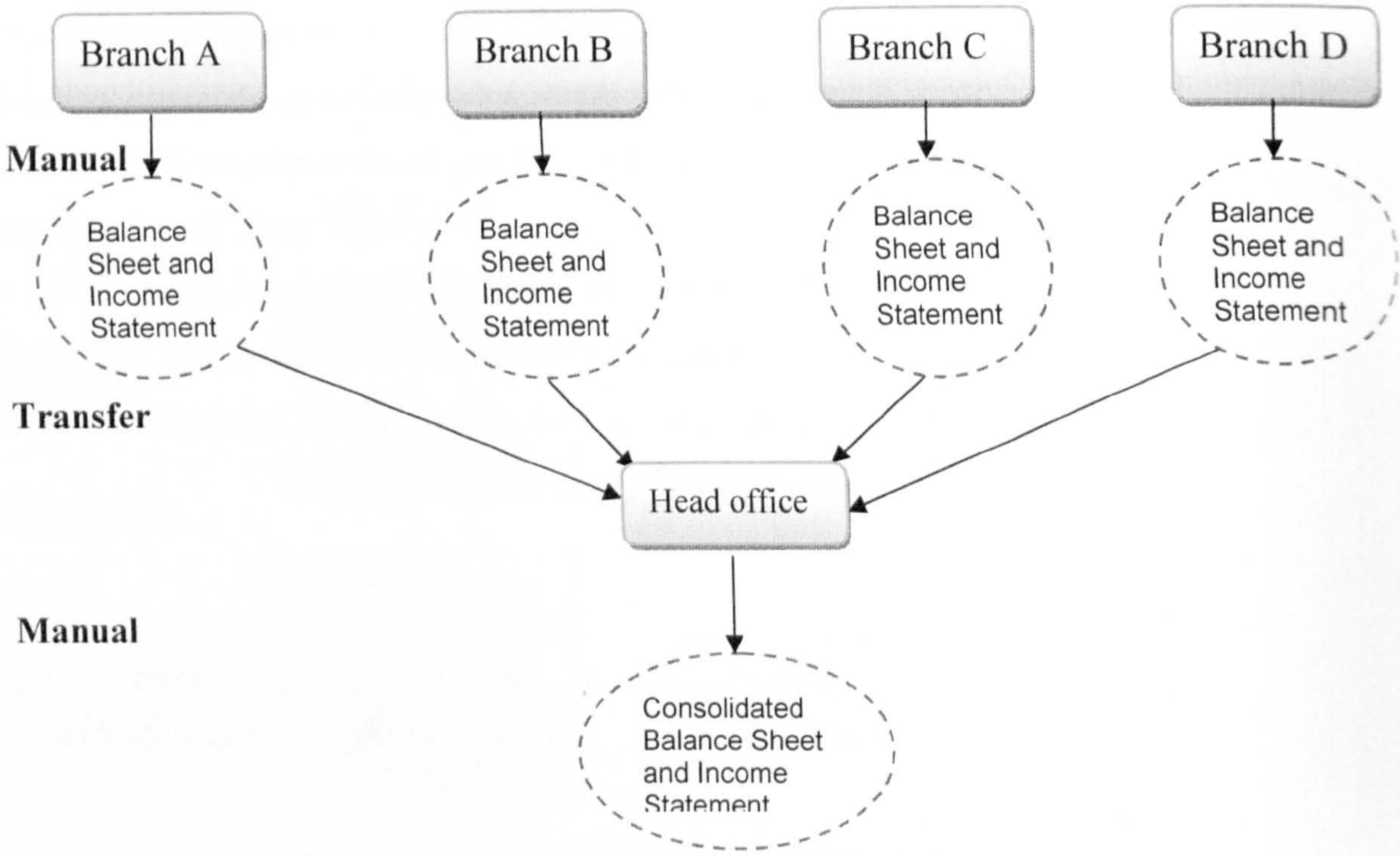


Figure 5-6 Preparation of Balance Sheet and Income Statement (Old System at CDB)

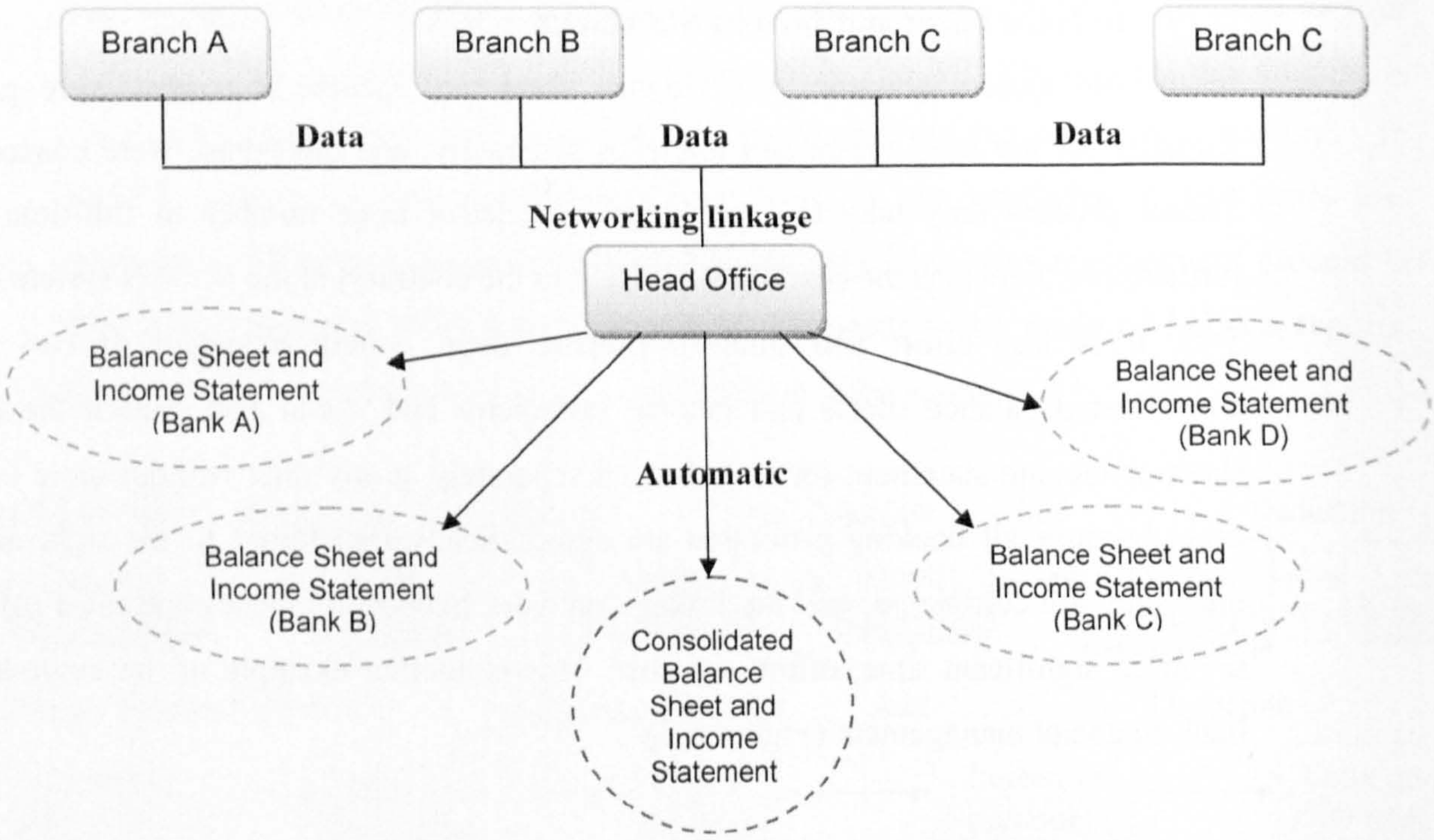
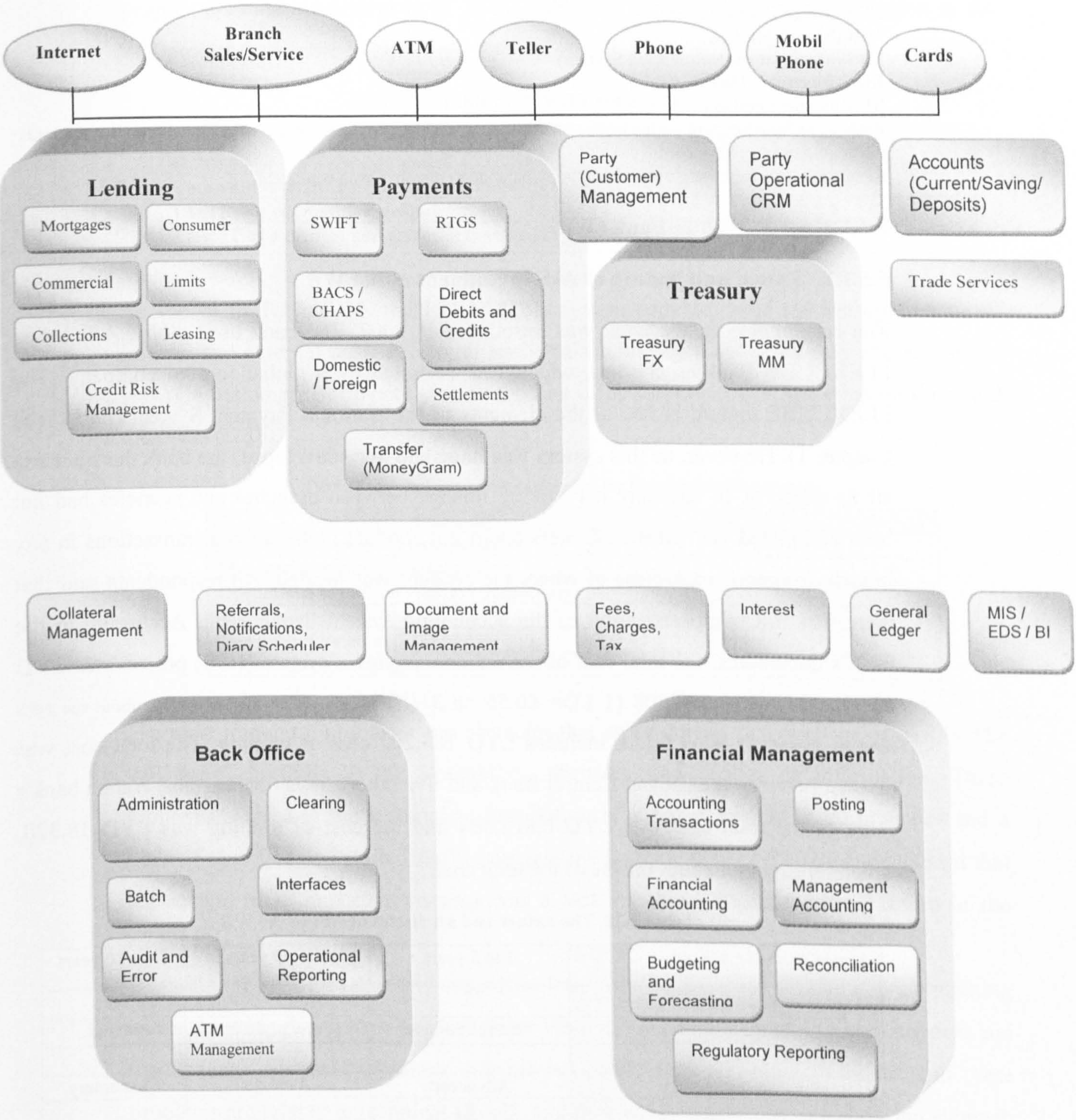


Figure 5-7 Preparation of Balance Sheet and Income Statement (Misys System at CDB)

Figure 5-8 Misys System (Bank of Commerce and Development) (Source: CDB documents)



Limits, such as Legal Lending Limit, Credit Limit and Foreign Exchange a daily trading limit

RTGS (Real Time Gross Settlement)
CRM (Customer Relationship Management)
BACS (Bankers Automated Clearing Services)
CHAPS (Clearing House Automated Payment System)
FX (Foreign Exchange)
MM (Money Market)
MIS (Management Information System)
EDS (Electronic Data Systems)
BI (Business Intelligence)
Posting, in bookkeeping, to list on the bank's records, such as to list the detail of operations on the accounts receivable or payable records
Reconciliation, adjusting one's check book balance to match a bank statement

5.5.1 Case 2: Wahda Bank (WB)

5.5.1.1 Extent and Nature of AIS Investment at the WB

The current AIS in the bank was introduced in 2007. The bank used global AIS called FLEXCUBE Banking System, which was designed by a global foreign company. The FLEXCUBE system is one of the elements of the National Payment System (NPS) (see Chapter 1). However, as this system was huge and very developed, the bank does not use all its capacity. In addition, networking linkage between branches and agencies had not been completed yet. Thus customers could not conduct their banking transactions in any branch or agency regardless of where the account was located. All respondents said that there was full computerisation of the accounting system in the bank. According to the bank's documents, the total cost of the national payment system (NPS) project was LYD 67,393,084 by 30/06/2008 (1 LD= £0.55 on 31/12/2008). (For further details about the NPS refer to chapter 2). This figure includes LYD 183,202 cost of training. The total cost was divided between the Libyan Central Bank and five other Libyan banks. The Wahda bank's share of the total cost was LYD 6,813,504 and the cost of training was LYD 18,320, which represented about 0.27% of the total cost.

Table 5-28 The nature and attributes of AIS in the WB

Age of Current AIS	1 to 5 years	5 to 10 years	Over 10 years
Interviewees Number	5		
Designer of the system	Local designer	Foreign designer	Mixed
Interviewees Number		5	
Implemented technology	Advanced	Average	Elementary
Interviewees Number	5		
Computerisation of AIS	Computerised	Mixed	Manual
Interviewees Number	5		

The WB does not compete at the cutting edge of innovation and the bank does not view IT as a critical and essential investment area. However, the bank uses IT as a competitive weapon, also the investment in IT in the bank was a requirement of participation in the NPS project (see Table 5-29).

Table 5-29 WB's use of IT

Statement	Yes	No
Competition at the cutting edge of innovation	1	4
Use IT as a competitive weapon		**5**
View IT as a critical and essential investment area	2	**3**

As shown in Table 5-30, the FLEXCUBE system provides required information to all internal and external users and to all levels of the management in an easy and accessible way. On the other hand, there was no top line information (EIS) or information for board members (DSS).

Table 5-30 Information generated by the accounting system

Types of information	Yes	No
Financial statement for external users	5	
Managerial reports for internal users	5	
Operational reports on business transactions	5	
Statistical reports	5	
Top line information (EIS)		5
Information for board members (DSS)		5

The most important problems and obstacles that arose during the operation of AIS in The WB were shortfalls in the availability, accuracy and quality of information. These problems ascribe to the incomplete installation of the new system in all branches and a Lack of qualified and skilled staff to operate the system. 40% of the respondents said that the second most important reasons was a lack of communication infrastructure in the country, as a whole.

Regarding the maintenance and support of the system, there were problems in maintaining and supporting the system because there were no specialists in the bank to support and maintenance advanced systems. All Libyan banks face the same problems and these problems are related to technical factors, and they were related also to the human element. However, once the system was in full use and the networking linkage between all branches has been completed, these problems could be overcome (see Table 5-31).

Table 5-31 The most important problems and obstacles at WB

Problems and Obstacles	WB1	WB 2	WB 3	WB4	WB5
Kinds of problems and obstacles	A problem in availability of information on time, and operating and supporting the system	A problem in availability of information on time and some reports cannot be obtained	A problem in availability of information on time, and a lack of accurate information	A problem in the availability of information on time	Shortfall in the availability, accuracy and quality of information
Maintenance and support of the system	There are no specialists in support and maintenance of advanced systems				
Reasons of these problems	A lack of communication, there is a lack in qualified human resources to operate the system	A lack of expertise and a lake of communication, and transferring from old system to the new system	Incomplete installation of the new system in all branches, the staff is not qualified, and a lack of communication infrastructure in the country	Incomplete installation of the new system in all branches	Incomplete installation of the new system in all branches
Exclusive to the bank or all Libyan bank	All Libyan banks		All Libyan banks		
Related to human or technical factors	Human element and technical factors	Human element and technical factors	Technical factors	Technical factors	Technical factors

The FLEXCUBE system is easy to use because the bank was using a part of the system, and there were instructions for all banking transactions. The system needed qualified and specialised staff. In addition, to use the full capacities of the system, the employees needed good training and up-skilling (see Table 5-32).

Table 5-32 Ease and simplicity of use of the system

Respondents	Yes	No	Why?
WB1	√		The system is clear and easy.
WB2	√		While information can be obtained easily, it requires more training for employees.
WB3	√		If there is good training.
WB4	√		The bank is using a part of the system, so it is easy and simple to use because it saves time and effort.
WB5	√		It needs qualified and specialised staff, because the system is clear and there are instructions for all banking transactions.

With reference to the main business areas of the bank that IT projects were being used for, Table 5-33 shows that most of the bank's business activities were covered by IT projects.

Table 5-33 Main banking business area

Respondents	Main areas of business
WB1	All services are provided by the bank.
WB2	Documentary credits and assessment of the currency only.
WB3	Most banking business activities.
WB4	Most banking business activities.
WB5	The bank now is applying the technology in t most of business areas.

Table 5-34 shows users the information and how often they use it. 'bank's top executives/board members' used the information most frequently (Rank 1), followed by 'managers in the bank' (Rank 2). On the other hand, two respondents said that 'operatives, controllers and office staff' rarely used the information (Rank7).

Table 5-34 Users of the information generated by the AIS

Users	Yes	No	Frequency of the rank							Rank in total	
			1	2	3	4	5	6	7	*Average	Rank
Bank top executives/Board members	5		3	1	1					1.6	1
Managers in your bank	5		1	2		1	1			2.8	2
Governmental bodies	5				3			1	1	4.4	3
Shareholders	5			1		1	2		1	4.6	4
Tax department in the finance ministry	4	1		1		1		1	1	4.75	5
Investors and creditors	4	1				2	1	1		4.75	5
Operatives, controllers, office staff	4	1			1	1		1	1	5	7

*to rank the users, the frequency of the rank was given weight as following: Σ FR x R / RN, where FR= Frequency of the rank, R= Rank and RN= number of Respondents.

5.5.1.2 Investment in AIS, Business Processes and Business Performance at the WB

Interview responses illustrate the significance of benefits gained from IS investment. All respondents assessed the system as an efficient and effective system. Table 5-35 shows that the important benefits that could be gained from the efficient deployment of the AIS were as follows:

- Accurate information was available on time and easily.
- Time and effort were saved.
- Information was provided accurately and easily to all users, at a greatest speed.
- The bank's performance improved.

However, there were obstacles which kept the bank from being more effective in its use of the AIS, which can be summarised as follows:

- Lack of skilled staff.

- Delays in data entry and lack of communications as a result of incomplete installation of the new system in all branches and incomplete network linkage between branches.
- Lack of training and up-skilling of the employees.

It is noted that these obstacles are the same as those mentioned in the first section, which arose during the operation of the AIS.

Regarding the assessment of the cost and benefits of the AIS, the AIS's benefits outweigh its cost, and there was substantial saving through the use of IT because the central bank of Libya bore a large part of the cost of system. However, there was no a feasibility study for the new system because it was imposed by the Central Bank of Libya.

With reference to the availability of the information, the system provides required information to internal users constantly, and Provides monthly reports and statistical to central bank and other governmental bodies.

Table 5-35 Assessment of the effectiveness and the efficiency of the AIS

Statement	WB1	WB2	WB3	WB4	WB5
The important benefits that may be gained from efficient deployment of AIS.	It provides necessary information on time and saves time and effort, and The bank's performance improved	The speed of providing information to all users easily and accurately	Providing monthly reports and statistics to central bank and other governmental bodies.	It provides required informatio n on time	It provides required information on time
The obstacles that keep the AIS from being more effective	training the staff on the new system	A lack of training and skilled staff.	Delays in data entry as a result of incomplete installation of the new system in all branches, and incomplete link between branches		The communications as a result of incomplete installation of the new system in all branches and networking between branches, and a lack of good training
Evaluate cost /benefit of AIS		Its benefits great compared with its cost	Its benefits were greater, especially in long term	Its benefits will be greater in long term	The benefits great compared with its cost
The availability of information to all users (internal/ external)	Available on time to all users	Available to all users	Available to all users	Available on time to all users	Available on time to all users

Regarding the influence of investment in IT on the bank's reputation, investment in IT has a positive influence on the bank's reputation. Table 5-36 summarises this influence as follows; a significant effect on the bank's reputation and creation of new services;

increasing speed of completion of transactions and providing new services; helping the bank to achieve its goals and gain competitive advantage; and saving time and effort.

Table 5-36 Influence of investment in IT on the bank's reputation

Respondents	Influences
WB1	A significant effect on the bank's reputation and creation of new services
WB2	Increasing speed of completion of transactions and providing new services
WB3	A significant impact on the bank's reputation
WB4	Helping the bank to achieve its goals and gain competitive advantage
WB5	Saving time and effort

Although the linkage between the branches had not been completed yet, the current AIS was effective in supporting managers in decision-making and problem solving. In order to achieve a maximum benefit from the system, there should be training and up-skilling of the workforce. However, the system was not effective enough, because the new system had not been used in all branches yet.

Table 5-37 Effectiveness of AIS in supporting managers in decision making and problem solving

Respondents	Effectiveness
WB1	It is effective in supporting managers in decision-making and problem solving.
WB2	It is effective in supporting managers in decision-making and problem solving.
WB3	It is effective in supporting managers in decision-making and problem solving.
WB4	It is not effective in supporting managers in decision-making and problem solving.
WB5	It is effective in supporting managers in decision-making and problem solving.

Because of the need to develop the AIS in response to the development and changes in the Libyan business environment, especially regarding the NPS project, there was an urgent need to develop the AIS to provide new services and meet customer requirements. In addition, the bank has changed its system in line with Libyan business development and it is also one of the participants of the NPS project, which includes the whole banking business (see Table 5-38).

Table 5-38 Needs to develop AIS

Respondents	Need to develop
WB1	There is an urgent need to develop the AIS to provide new services and meet customer requirements.
WB2	The bank has changed its system in line with Libyan business development especially with the NPS project.
WB3	There is an urgent need to develop the AIS.
WB4	It is a necessary to develop AIS in response to the developments in Libyan business environment.
WB5	There is a need to develop AIS at the same time as a development of IT.

In the WB, AIS has an essential role in competition; due to the openness of the Libyan banking system to competition with foreign banks, the Central Bank of Libya led Libyan banks to develop banking technology and service development, therefore it adopted the NPS strategy to enable Libyan banks to compete with foreign banks to provide the same services at the same level. In addition, AIS enabled the bank to use new products, keeping up with the competition, maintaining existing customers, obtaining new customers and rapidly completing of services. Moreover, AIS leads to providing services to customers in a faster time, more convenient manner, with better quality and less effort and cost, thus these will give a competitive advantage to the bank. At the time of the study, banking business depended on IT, thus if there was no investment in technology the bank would not have been able to compete (see Table 5-39).

Table 5-39 Role of AIS in gaining competitive advantage

Respondents	Role of IT
WB1	Due to the openness of the Libyan banking system to competition with foreign banks, the Central Bank of Libya led Libyan banks to develop banking technology and service development, therefore it adopted the NPS strategy to enable Libyan banks to compete with foreign banks to provide the same services at the same level
WB2	It enabled the bank to use new products, keeping up with the competition, maintaining existing customers, obtaining new customers and rapidly completing.
WB3	IT leads to providing services to customers in a faster time, more convenient manner, with better quality and less effort and cost, thus these will give a competitive advantage to the bank.
WB4	Banking business depends on IT, thus if there was no investment in technology the bank would not have been able to compete.
WB5	Meeting customers' requirements, reducing time of transactions accomplish maintaining existing customers and obtaining new customers.

Currently the deployment of AIS was not enough to improve business performance, and the deployment of AIS system was sufficient but needed more efficiency to develop business performance (see Table 5-40). the following suggestions for AIS to improve business performance; use of data mining and data warehouse which is the next stage, completion of networking linkage between branches, good training and up-skilling the employees, taking advantage of advanced foreign banks in this area, and development of communications infrastructure.

Table 5-40 Role of AIS in improving business performance

Respondents	Role of IT	
	Level of IT is sufficient to improve business performance	**If it is not sufficient, how can it be improved?**
WB1	The level of AIS now is sufficient.	After using of the data mining and data warehouse which is the next stage with skilled staff, for develop business performance and support decision-making.
WB2	The level of AIS is not sufficient enough to improve business performance.	By training and up-skilling the employees for new system and develop the infrastructure of communications.
WB3	Now the level of the AIS is not enough to improve business.	It needs to good training in technology area, take advantage from advanced foreign banks in this area.
WB4	The AIS is not sufficient to develop business performance.	It could be improved through a completion of networking linkage between branches, and good training and up-skilling the employees.
WB5	The AIS is sufficient but need more efficiency to develop business performance.	It could be improved through a completion of networking linkage between branches.

Regarding the effects of the upgrade in AIS infrastructure on the structure of the workforce and activities in the bank (see Table 5-41), these effects can be summarised as follows; reducing time of transactions accomplishment; providing new banking products and activities; supporting security of system; saving time and effort; helping managers to assess the performance of the employees; and improving and developing the quality of banking services.

Table 5-41 Effects of the upgrade in AIS infrastructure on structure of the workforce and activities

Respondents	Effects
WB1	It reduces time of transactions accomplishment and provides new areas of banking activities.
WB2	It provides new banking products and increases activities of bank.
WB3	It has positive effects on bank's income through improving existing services, providing new services, supporting security of system and saving time and effort.
WB4	It gives a big chance to develop banking services and providing new services.
WB5	It helps employees to accomplish their work well, and helps managers to assess performance of the employees and improves and develops quality of banking services.

The banking transaction cost and number of staff were decreased as a result of the upgrade of AIS infrastructure, thus lead to an increase in income. On the other hand, the upgrade of AIS infrastructure has no impact on banking transaction costs and the number of staff because the technology needs operators and support 24/7 (interviewee 6, p266). According to the number of branches, there was no impact on the number of branches, because the

branches' number depends on a feasibility study, but the use of technology may reduce the number of branches in the future.

The most important factor driving investment in AIS was 'to increase and improve customer services' followed by 'increasing internal efficiency'. In the third rank was 'an increase in the understanding of customer needs'. On the other hand, the last two factors were 'increased efficiency of business transactions' and 'defending current market share position respectively' (Table 5-42).

Table 5-42 Factors driving investments in AIS at WB

Factors	Yes	No	Frequency of the rank								Rank in total	
			1	2	3	4	5	6	7	8	*Average	Rank
Improve and increase customer services	5		2	1	1	1					2.2	1
Increase internal efficiency	5		1	3						1	3	2
Increase understanding of customer needs	4	1	1		1	1		1			3.5	3
Cut service prices/lower service costs	4	1		1	2			1			3.5	3
Create overall market growth (create new demands)	4	1			1	1	1		1		4.75	5
Market share growth (take from competition)	5					2	2		1		5	6
Increase efficiency of business transactions	5		1						4		5.8	7
Defend current market share position	5						1	3		1	6.2	8

*to rank the factors, the frequency of the rank was given weight as following: Σ FR x R / RN, where FR= Frequency of the rank, R= Rank and RN= number of Respondents.

The factors listed in Table 5-43 that contribute to the success of the bank's AIS. The first factor was 'supportive bank management and users', and in the second rank was 'the technical skill of IS staff members'. In the third rank was 'customer service attitude towards ISs'. 'Providing quality and innovation services to the customer', this was the last factor with eighth rank.

Table 5-43 The factors contributing to the success of bank's AIS at WB

Contributors	Yes	No	Frequency of the rank								Rank in total	
			1	2	3	4	5	6	7	8	*Average	Rank
Supportive bank management/users	5		2	1		2					2.4	1
Technical skills of IS staff members	5		1	1	2				1		3.2	2
Customer service attitude towards ISs	3	2					1		1	1	3.67	3
Reduce cost and errors	4	1	1	1				1	1		4	4
Alignment of IS and business strategies	3	2		1	1				1		4	4
Adequate funding	5		1			1	1	2			4.4	6
Partnering with external service provider(s)	4	1			1	1	1	1			4.5	7
Provide quality and innovative services to the customer	5			1		1	2			1	4.8	8

*to rank the contributors, the frequency of the rank was given weight as following: Σ FR x R / RN, where FR= Frequency of the rank, R= Rank and RN= number of Respondents.

Table 5-44 below shows the most important benefits of IT and their ranks in order of importance, in the first rank was 'giving the bank a competitive advantage'. The second rank was 'providing a way for the bank to reduce costs', with 'enabling the bank to increase revenues' in the third rank. There were two benefits in the fourth rank, which were 'assisting and supporting the needs of the bank's business' and 'playing an integral role in meeting customer requirements'. In the sixth and last rank was 'IT is an important component and is aligned to business strategy'.

Table 5-44 Benefits of IT at WB

Statements	Yes	No	Frequency of the rank						Rank in total	
			1	2	3	4	5	6	*Average	Rank
IT gives your bank competitive advantage	5		1	2	2				2.2	1
IT provides a way for your bank to reduce costs	5		1	2	1	1			2.4	2
IT enables your bank to increase revenues	5		2		1	1		1	2.8	3
IT assists and supports the needs of your bank's business	5				1	1	3		4.4	4
IT plays an integral role in meeting customer requirements	5			1		2		2	4.4	4
IT is an important component and is aligned to your business strategy	5		1				2	2	4.6	6

*to rank the statements, the frequency of the rank was given weight as following: Σ FR x R / RN, where FR= Frequency of the rank, R= Rank and RN= number of Respondents.

The bank provides all the items listed in Table 5-45 to implement, support and develop AIS and these were ranked as follows: first was 'providing enough funds for on-going investment in AIS', and second was 'technical tools to develop and support AIS'; 'providing outside specialist experts when required' was the third rank, and in the fourth and last rank was 'providing skilled personal to implement and support the AIS'.

Table 5-45 Items to implement, support and develop AISs

Items	Yes	No	Frequency of the rank				Rank in total	
			1	2	3	4	*Average	Rank
Enough funds for on-going investment in AIS	4	1	3	1			1.25	1
Technical tools to develop and support AIS	5		1	2	2		2	2
Outside specialist experts when required	5			2	3		2.6	3
Skilled personal to implement and support the AIS	4	1	1			3	3.25	4

*to rank the items, the frequency of the rank was given weight as following: Σ FR x R / RN, where FR= Frequency of the rank, R= Rank and RN= number of Respondents.

All benefits of IT banking services listed in the Table 5-46 are evident in the bank, and rank of the evident benefits as follows; 'IT banking services save their time' and 'provide accurate accounting information' in the first rank and the second rank respectively. 'IT banking services make their banking more convenient' and 'Easy to use IT banking services' were the third and fourth rank respectively. 'Provide privacy in their banking transaction in terms of the rank of respondents' was the fifth and last rank.

Table 5-46 Benefits of IT banking services achieved

Benefits	Yes	No	Frequency of the rank					Rank in total	
			1	2	3	4	5	*Average	Rank
IT banking services save your time	5		3	1	1			1.6	1
IT banking services provide accurate account information	4	1	1		2	1		2.75	2
IT banking services make your banking more convenient	5			3	1		1	2.8	3
It is easy to use IT banking services	4	1	1		1	1	1	3.25	4
IT banking services provide privacy in your banking transaction	5			1		3	1	3.8	5

*to rank the benefits, the frequency of the rank was given weight as following: Σ FR x R / RN, where FR= Frequency of the rank, R= Rank and RN= number of Respondents.

With respect to main business functions and IS profiling at the WB, according to interviews that were conducted with relevant staff, bank documents and the researcher's observations show that the FLEXCUBE system is very advanced and covers all main business processes and main banking financial activities. Figure 5-9 shows a map of documentary credits process and figures from 5-11 to 5-15 illustrate the drawing up of a contract (opening credit) in the FLEXCUBE system. Also the ORACLE Human Resources (HR) package is used for personnel records management, payroll, and expenses claims processing. Oracle is a global company and provides integrated business software and hardware systems, and many solutions and applications such as human resource systems and archiving and accounting systems. In addition, the system is sound and does not need replacing, but needs more activation through completion of networking between branches, providing experts in technology for support and maintenance, and good training and up-skilling of the employees on the system. The implementation of FLEXCUBE represents a major step forward in the exploitation of AIS and associated technologies in the WB. The system has been implemented to support all main process functions, with the

exception of HR/Payroll, where the Oracle HR package has been implemented to complement the main Oracle FLEXCUBE modules (Figure 5-10).

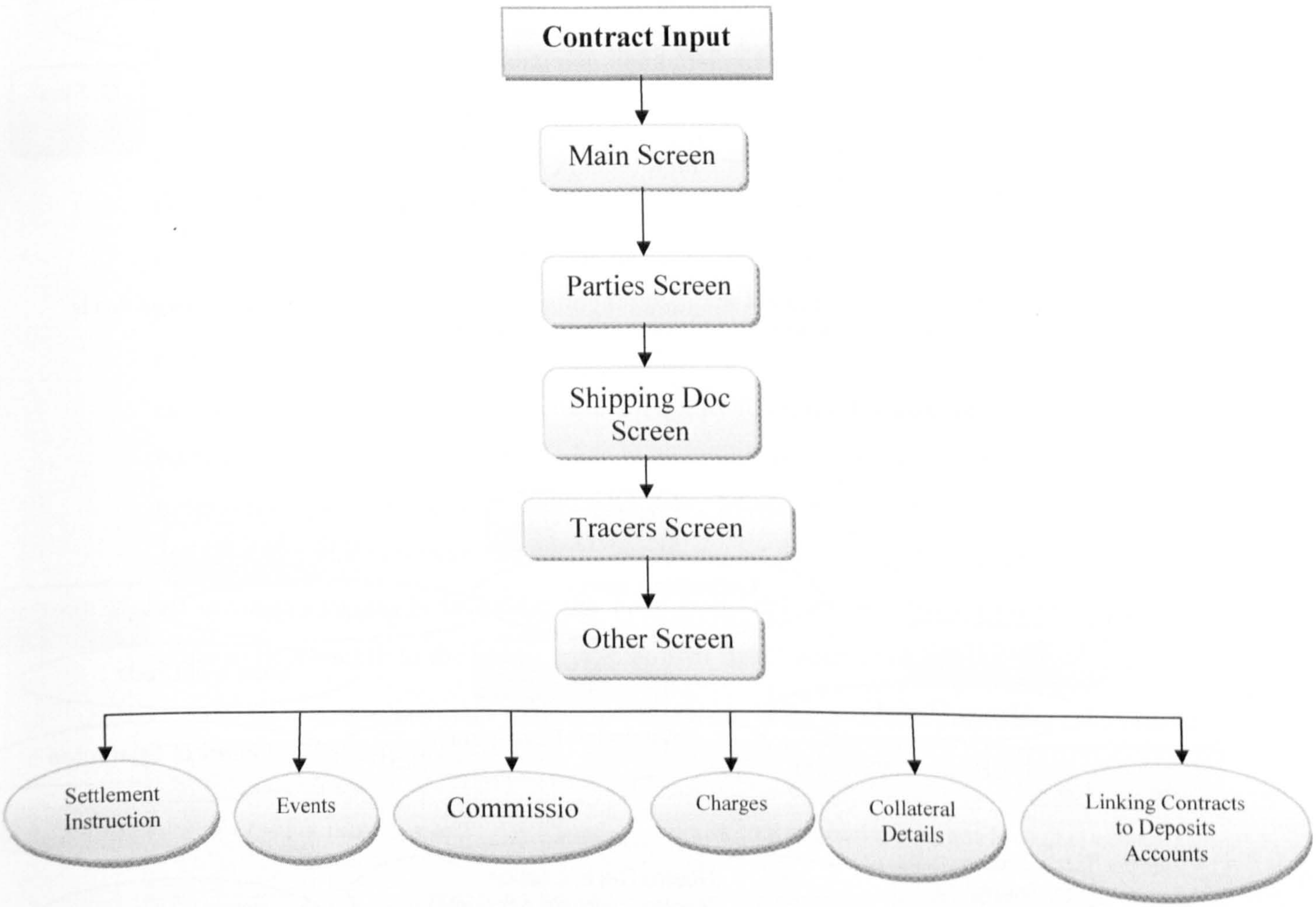
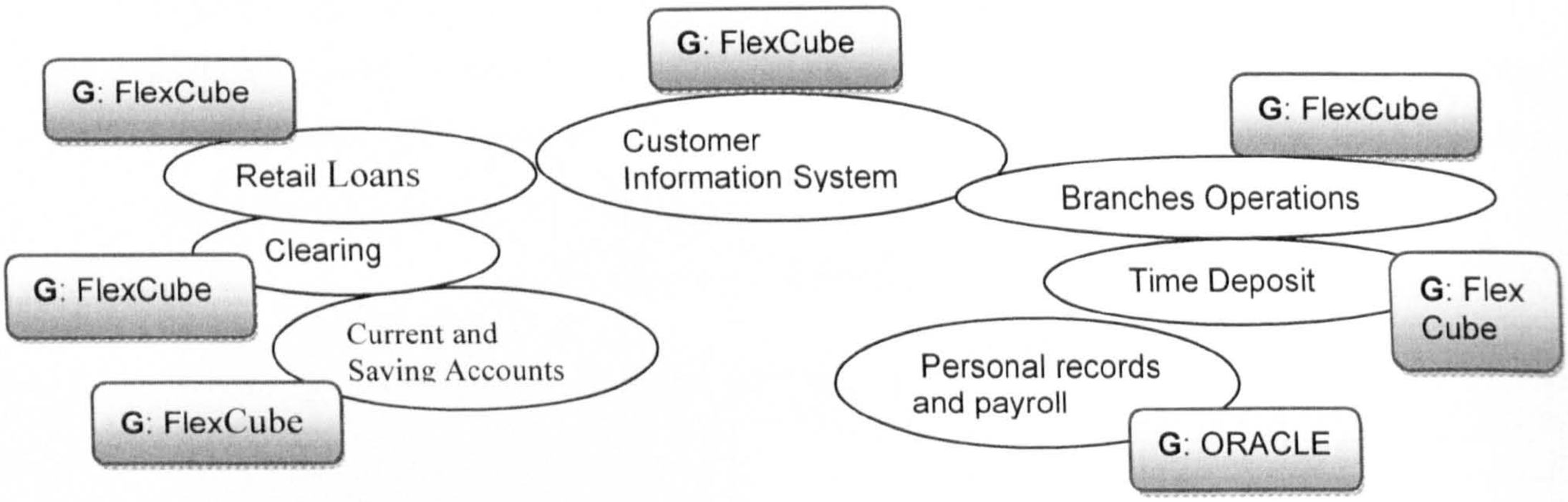


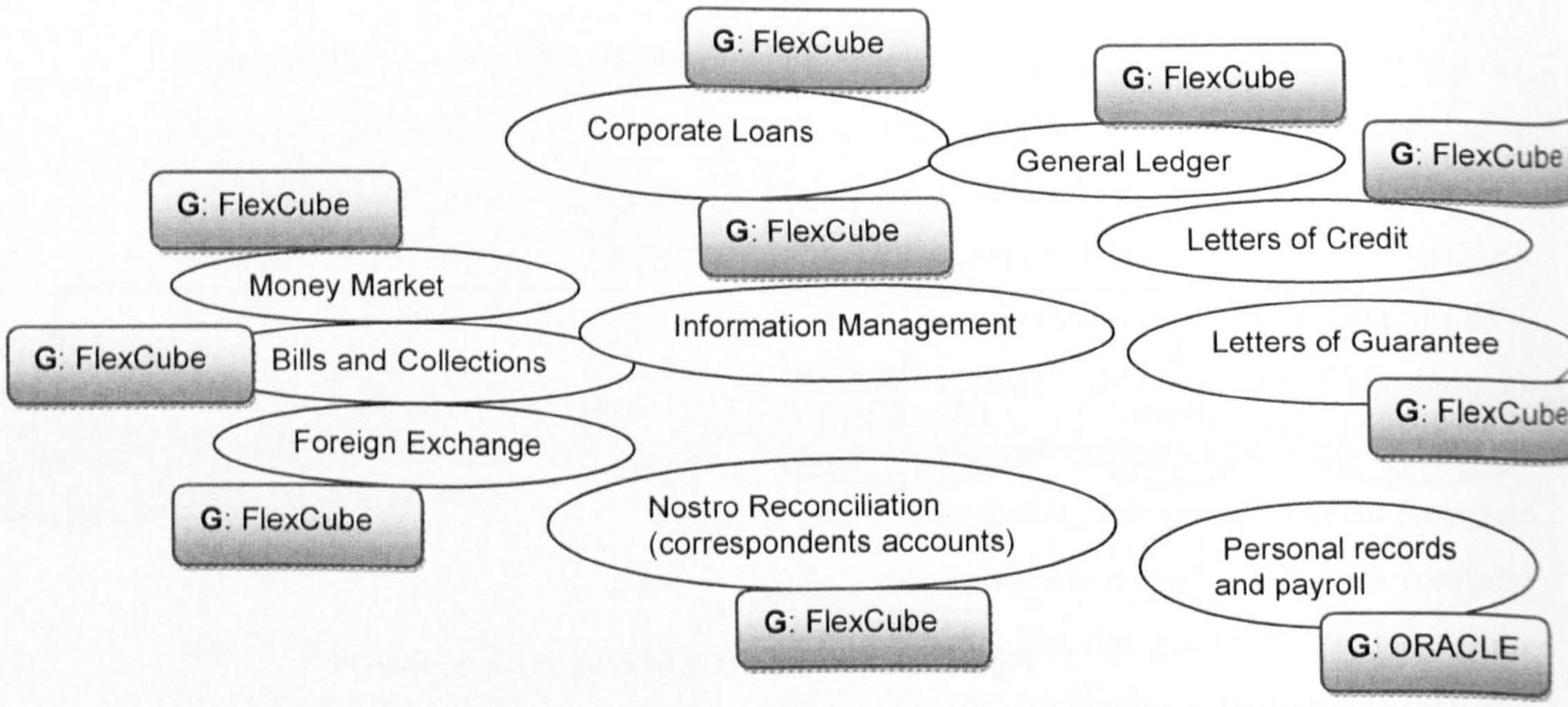
Figure 5-9 Benefits of AIS banking services achieved

- **Retail Business**



Notes: Flexcube system is a global and advanced banking system. G (Green) = indicates a system that is sound and may needs more activate and does not need replacing.

- **Corporate Business**



Notes: Flexcube system is a global and advanced banking system. G (Green) = indicates a system that is sound and may needs more activate and does not need replacing.
A nostro account is "an account owned by the host bank and maintained with a bank (usually) overseas" (M King, 2003)

Figure 5-10 Main Business Functions and IS profiling at the WB

(Based on systems profiling methodology developed by Wynn et al, 2009)

5.5.1.3 The Importance of Training and Up-skilling the Workforce at the WB

As Table 5-47 shows, employees were trained by internal trainers and FLEXCUBE CO. The trainers were trained outside the bank by the FLEXCUBE CO that designed the systems, and the employees also had training delivered by the trainers inside the bank.

In general, the bank's employees were fairly satisfied with the new system. At the beginning of using of the new system there was resistance by the employees because the work system had been dramatically changed. However, after seeing the results of the system there was satisfaction and contentment with it. Regarding respondents assessment to the training and up-skilling of the workforce programmes and policies, there was a lack of training programs and up-skilling in IT in terms of number and quality of training programmes; therefore, the advantage obtained from training programmes was not as required, because of the inappropriate nominations of employees for the training courses, and the fact that some employees were not qualified to benefit from the training. However, currently, management for training has been established in the bank and there are training programmes with the central bank of Libya. Moreover, all the bank's employees had attended computer courses. In addition, training on the new system must be provided for all management levels including the audit unit, and courses should be reconsidered in order to be a benefit to the trainees in their own field (interviewee 7, p. 272).

Table 5-47 Assessments of the training and up-skilling of the workforce programmes and policies

Respondents	Where were the employees trained?	Who trained them?	Are the employees satisfied?	Assessment of programmes and policies
WB1	In the bank and trainers outside the bank	Bank's trainers and FLEXCUBE CO	Fairly satisfied	There is a lack in training programs in the IT and up-skilling area
WB2	In the bank and trainers outside the bank	Bank's trainers and FLEXCUBE CO	Not satisfied	There are many training programs, but they are random and ill-considered
WB3	In the bank	Bank's trainers	Satisfied	There are not enough training courses at the required level in terms of number and quality
WB4	In the bank	Bank's trainers	Fairly satisfied	There is no plan for training and up-skilling the workforce
WB5	In the bank and trainers outside the bank	Bank's trainers and FLEXCUBE CO	Fairly satisfied	Still obtaining advantage of the courses training is not good

As regards the role that employees play in improving the ASI, the employees have a role in improving the system by submitting their suggestions to the special committee of the

management for study, and they are responsible for implementing these suggestions, and then adopting the most appropriate of them. Moreover, there were teams of senior officials in the bank; they suggested some changes to the new system (see Table 5-48).

Table 5-48 Employees' role in improving the AIS

Respondents	Role of employees
WB1	There is a special committee to study the proposals submitted by employees to improve the system and adopt the most appropriate of them
WB2	The employees submit their opinions to the management about the new system
WB3	There is a role for employees in improving AIS by submitting their suggestions to the management.
WB4	There were teams of senior officials in the bank. They suggested some changes about the new system
WB5	Through submitting their suggestions and notes to the management

The training and up-skilling of the workforce was essential to realise the benefits of AIS adequately and satisfactorily (see Table 5-49).

Table 5-49 Need of training and up-skilling of the workforce

Respondents	Extent of need		
	Very required	**Neutral**	**Not required**
WB1	Very important		
WB2	Very important		
WB3	Very important		
WB4	Very required		
WB5	Very important		

There was a complete agreement among the respondents that skilled employees in IT were very important to improve business performance. Employee skills levels can positively influence business performance if they are combined with an accounting qualification, through a better use of the capabilities of the system, expediting the completion of work and providing accurate information on time, saving time and effort, and organising work better. In addition, skilled employees in IT lead to improve the speed and accuracy of business and hence obtain a good quality of information and thus help to improve business performance. However, highly skilled staff have a negative effect on the bank, especially when a staff member is more skilled than their manager; thus the skills level should be equal in employee hierarchies (see Table 5-50).

Table 5-50 Employees' skills in IT

Respondents	The benefits of employees' skills in IT
WB1	It is very important to improve business performance through using the capabilities of the system better. However, the bank suffers from a lack of qualified and skilled staff.
WB2	It is very important to improve business performance. However, highly skilled staff can have a negative effect, especially when staff are more skilled than their manager, thus the skills should be equal.
WB3	Employees' skills in IT are greatly helpful to improve business performance when combined with an accounting qualification. They lead to expedite the completion of work and provide accuracy information in time.
WB4	there is a greater need for skilled staff in technology, skilled employees in IT lead to improve the speed and accuracy of business and hence obtain a good quality of information and thus help to improve business performance
WB5	It is greatly helpful to improve business performance, through providing information, saving time and organising work as well.

As summarised in Table 5-51, the impact on the delivery of the benefits of investing in AIS was not significant because training and up-skilling was weak compared with the high level of available technology. High skills levels and training were needed in terms of operation and security to use the capabilities of the system to an optimum level. In addition, lack of good training, inappropriate nominations of trainees have led to a failure to achieve the full benefits of investing in AIS in the bank. However, the training after implementation of the new system had a good impact on the delivery of the benefits of investing in IT through reducing errors and expediting the completion of business.

Table 5-51 Effects of training and up-skilling of the workforce on the delivery of the benefits of investment in AIS

Respondents	Effects of training and up-skilling
WB1	There are no significant effects because training and up-skilling now is weak comparing with the high level of available technology.
WB2	It has a positive impact but not as planned because of nature of the choice of trainees.
WB3	It has a positive impact through reducing errors and expediting the completion of business.
WB4	Lack of good training, inappropriate nominations of trainees have led to a failure to achieve the full benefits of investing in IS in the bank
WB5	The training after implementation of the new system had a good impact on the delivery of the benefits of investing in IT.

Most of the mentioned benefits in the Table 5-52 were delivered by the training and up-skilling of the workforce. The importance of these benefits can be ranked in accordance with respondents answer as follows; 'improve customer services' the first rank. There is little difference between 'improve the accounting control in terms of accuracy and recording transactions' and 'raise the capacity to deal with the growth in number of

transactions', which were the second and third respectively. There were two benefits in the fourth rank, which were 'reduce a number of errors' and ' improve competitive advantage of the Bank'.

On the other hand, the less important benefits were 'improve working conditions and competition' and 'reduce the number of employees of the bank' at the sixth and seventh rank respectively.

Table 5-52 Benefits of the training and up-skilling of the workforce

Benefits	Yes	No	Frequency of the rank							Rank in total	
			1	2	3	4	5	6	7	*Average	Rank
Improve customer services	3	2	1	2						1.67	1
Improve the accounting control in terms of accuracy and recording transactions	5		3			1		1		2.6	2
Raise the capacity to deal with the growth in number of transactions	3	2	1		1	1				2.67	3
Reduce the number of errors	4	1		2				2		4	4
Improve competitive advantage of the Bank	3	2			1	1	1			4	4
Improve working conditions and competition	3	2			1		2			4.33	6
Reduce the number of employees	2	3							2	7	7

*to rank the benefits, the frequency of the rank was given weight as following: Σ FR x R / RN, where FR= Frequency of the rank, R= Rank and RN= number of Respondents.

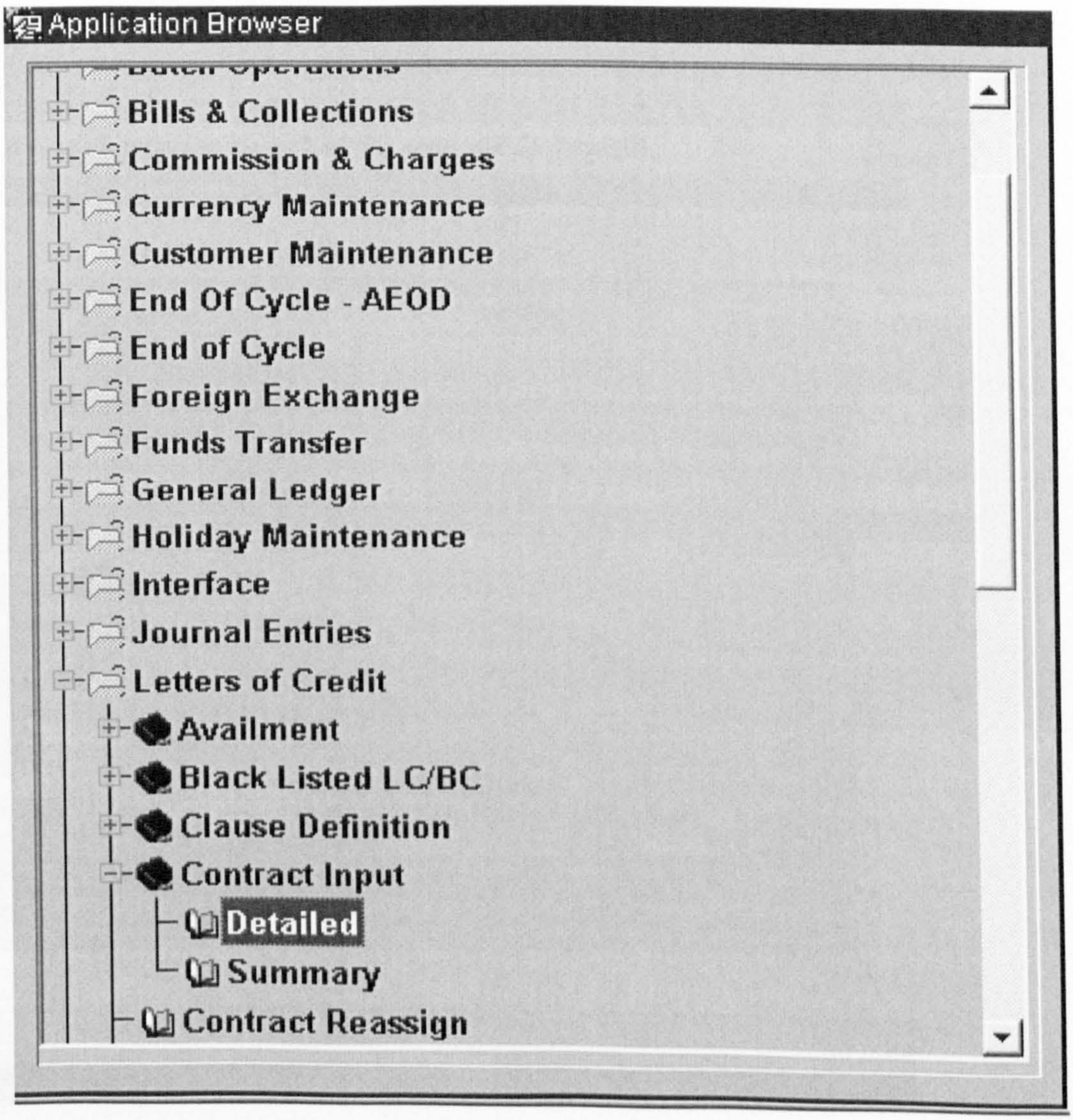
5.6 Documentary Credit Process in the WB in the FLEXCUBE System

Documentary credit is also called letters of credit, which is a banking tool to guarantee payment of the value of documents provided by a beneficiary that complies with the credit requirements. It is part of the loans management process and is an example of how FLEXCUBE has been used to automate a previous manual process.

- **Draw up a Contract (opening credit) in the FLEXCUBE System**

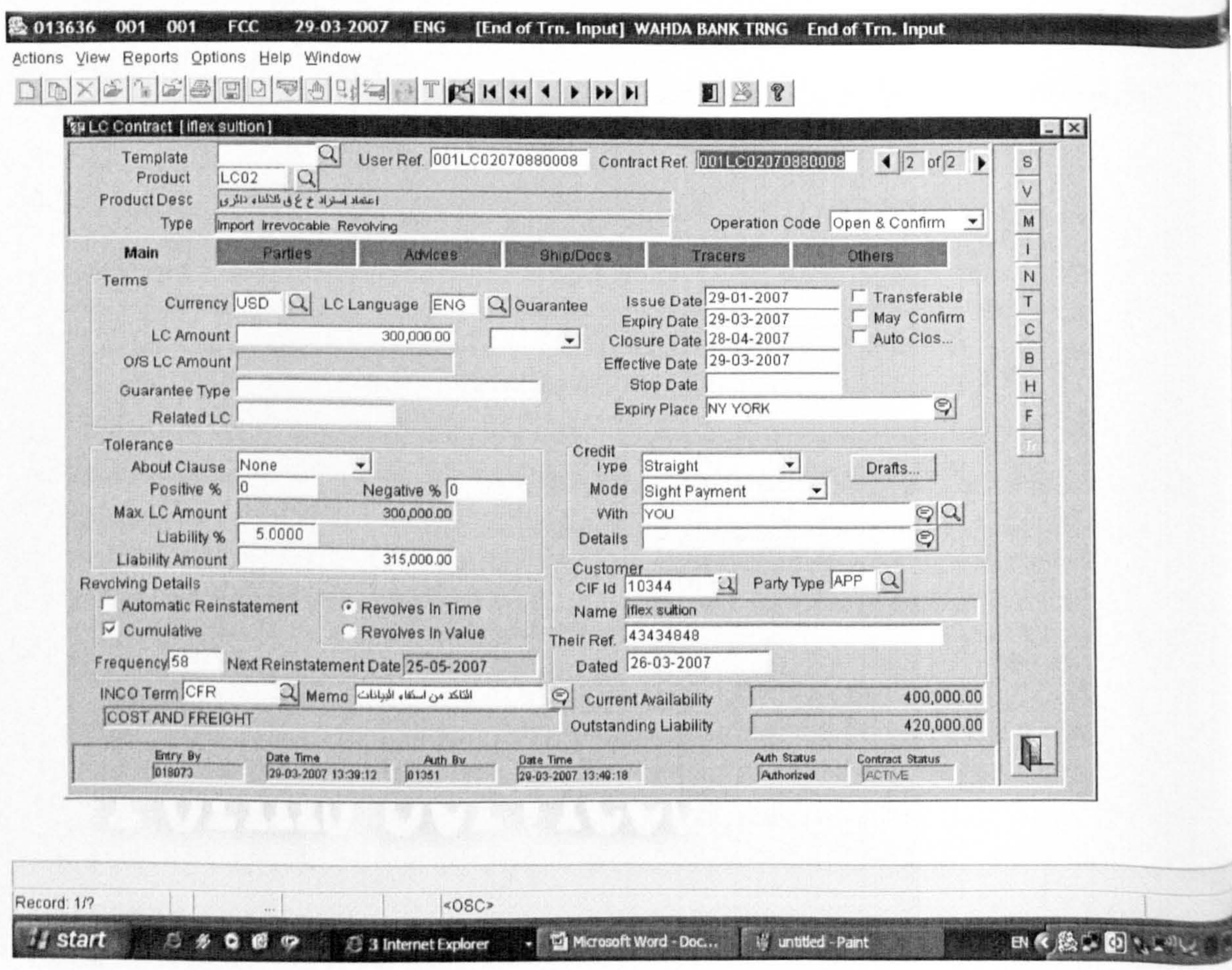
1. The screen CONTRACT INPUT is accessible by clicking on the LETTER OF CREDIT from the main menu screen as shown below (Figure 5-11).

Figure 5-11 FlexCube – Main Menu Screen at WB



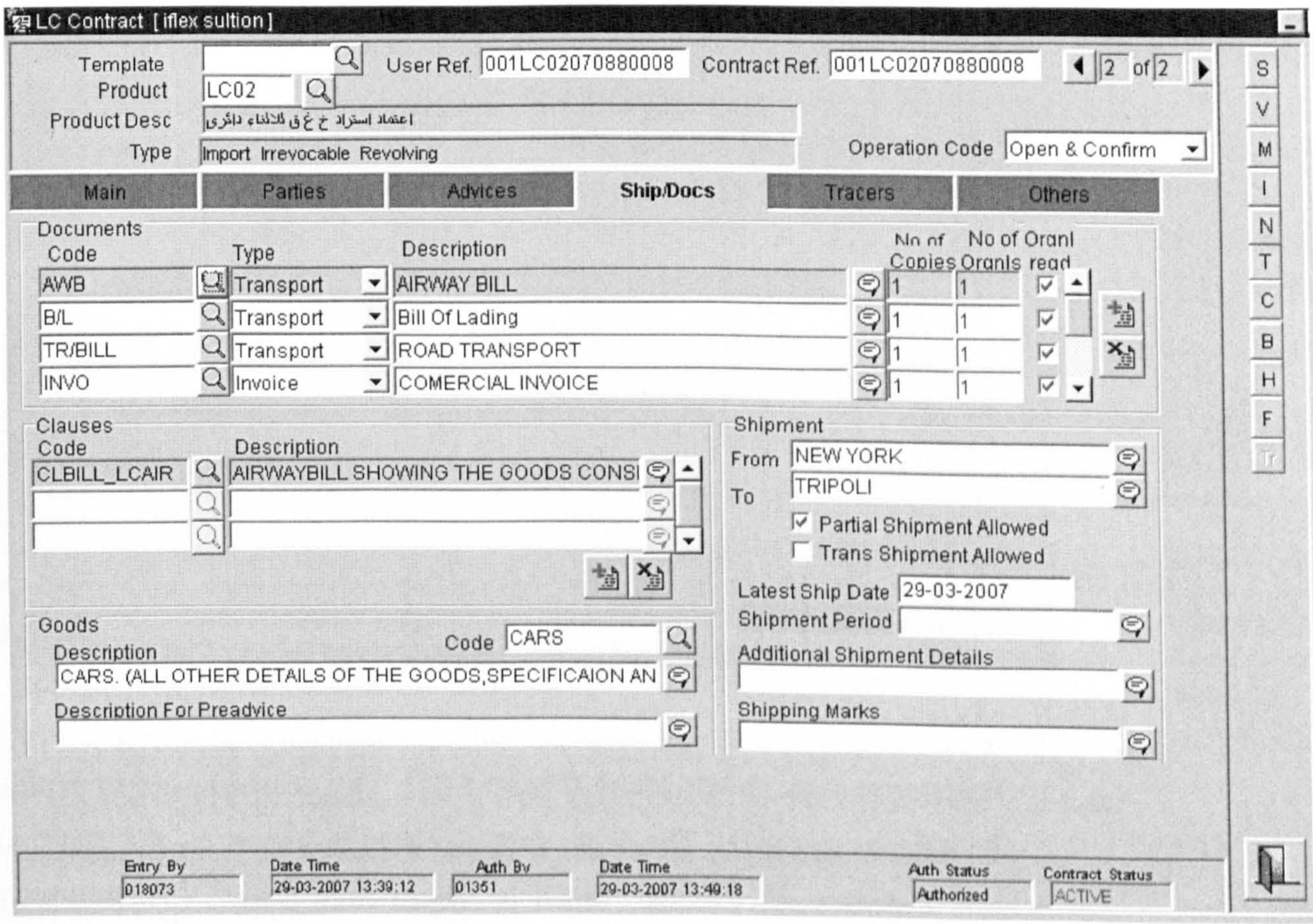
2. Clicking on option Detailed to get on the main screen to enter the contract as described below (Figure 5-12); click on the button NEW contract, select the appropriate product for the contract in the field PRODUCT COD; (by clicking on the TAB key on the keyboard, a contract number will appeared with a user number which can be modified by the user) choose the type of contract currency, choose the language of the contract, insert the contract value, choose a transaction code, choose delivery terms according to the contract, choose a payment method according to accreditation conditions, select the ID of the customer, and then insert all details about the parties concerned in the contract in English screen characters. Then move to screen notifications, on which appears all notices and SWIFT messages associated with the contract, with the possibility of adjustment according to the nature of the contract, in addition to the possibility to stop non-required messages by pressing on the suppress field.

Figure 5-12 The main screen to enter the contract at WB



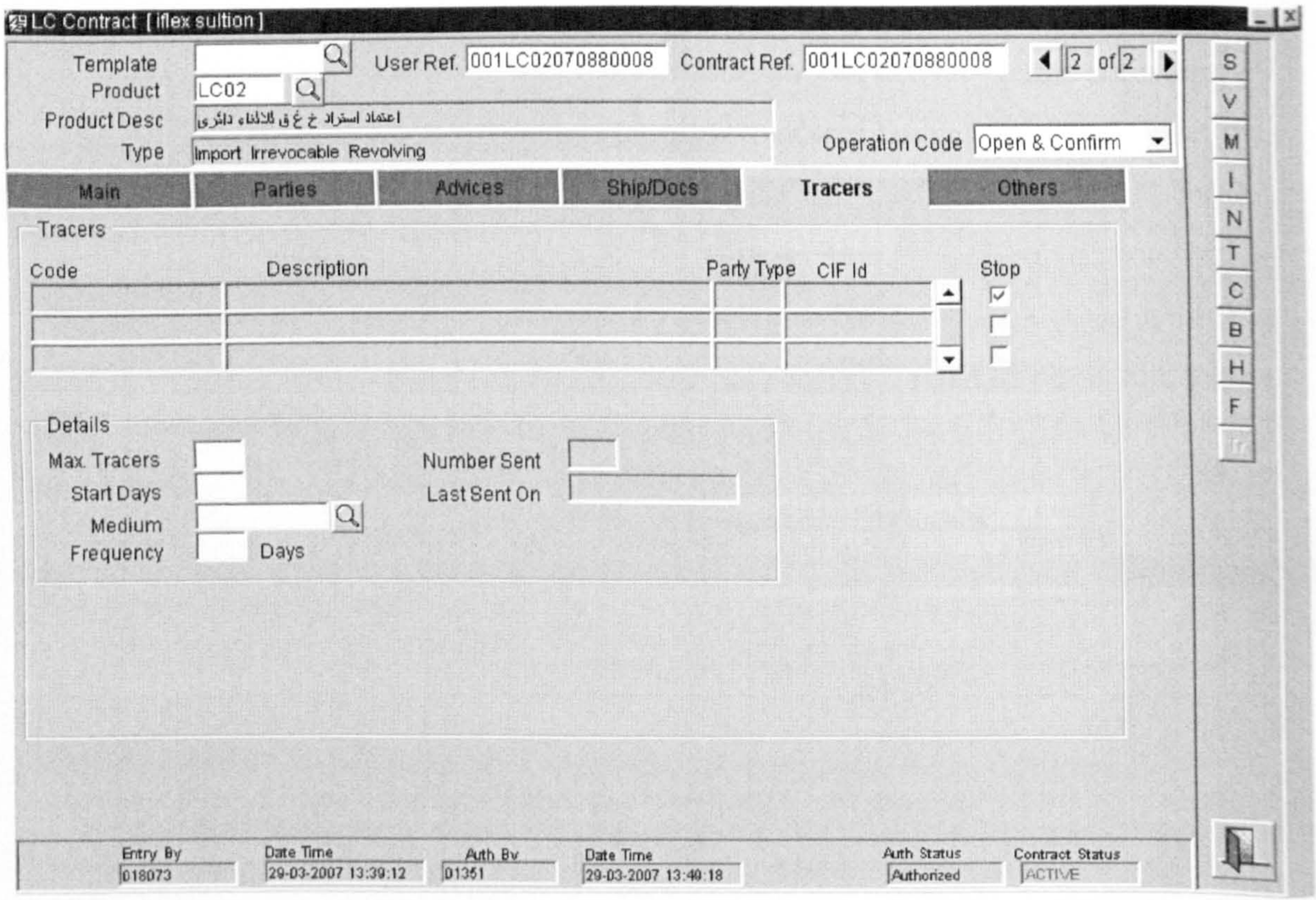
3. Screen of shipping documents; as displayed below(Figure 5-13), this screen shows the required shipping documents, required texts for each document, description of the goods with the choice of number of required copies for each document, with the ability to delete non-required documents, clarify port of shipment and arrival, and determine the last date for shipment. (The data of this screen is shown via SWIFT message)

Figure 5-13 Shipping documents at WB



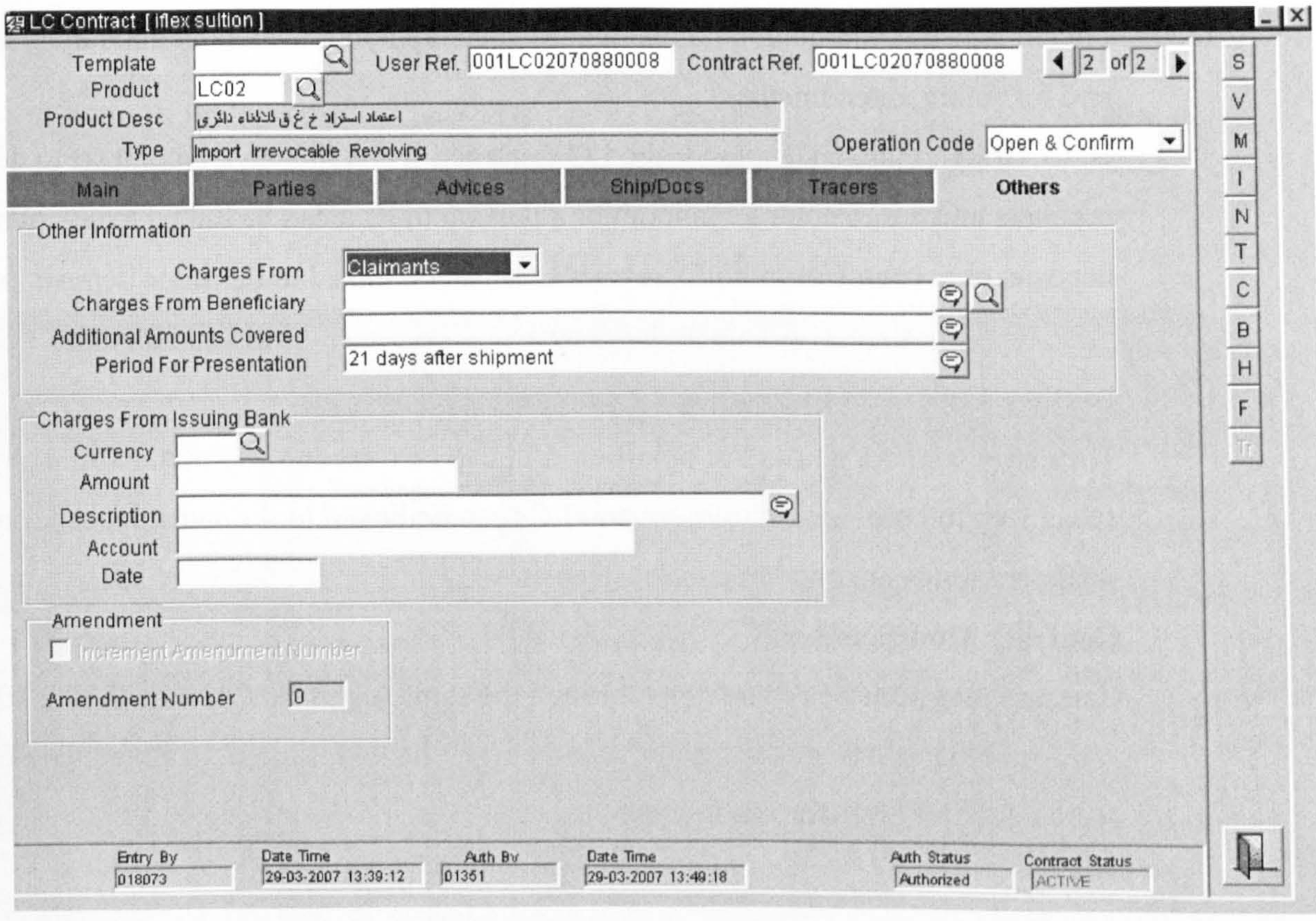
4. The Follow-up screen (Tracers); as shown below (Figure 5-14). This screen follows-up messages automatically and show the number of these messages and the means and number of days since they were sent, together with their frequency of transmission.

Figure 5-14 Follow-up screen at WB



5. Others screen; as shown below (Figure 5-15). This screen relates to expenses, and is divided into two parts. The upper part is related to import credits, and it shows who bears expenses of coverage, which is chosen from a field CHARGES FROM. In addition it determines the amount of coverage and the date of submission of documents. The lower part is about export credits, and determines currency and commission value and its description, and account numbers appear in this part.

Figure 5-15 Others screen at WB



The icons on the right hand side of the screen are used to input/display various details of the contract.

S: Settlement Details for the LC Contract

V: Events that have happened and the corresponding Accounting Entries and Messages. The screen gives the details of the Events generated in the life cycle of the Contract. Accounting Entries / Messages can be viewed in the respective Events

M: MIS Details of the LC Contract

I: Commission Details of the LC Contract. The screen gives the details of the Commission applicable for the contract.

N: Event wise charge Details of the LC Contract. The screen gives the details of the Charges applicable for the Contract.

T: Tax Details for the LC Contract

C: Collateral Details for the LC Contract. The screen gives the details of Collateral taken for the contract. The screen has to be visited for applying the Collateral during new input and for future amendments

B: Contract Linkage Details for the LC Contract. It can link an LC contract to deposits and accounts and entire contract amount or a portion of it; it can be linked to any number of deposits or accounts or to both. Several LCs can be linked to the same deposit, provided sufficient funds are available in the deposit

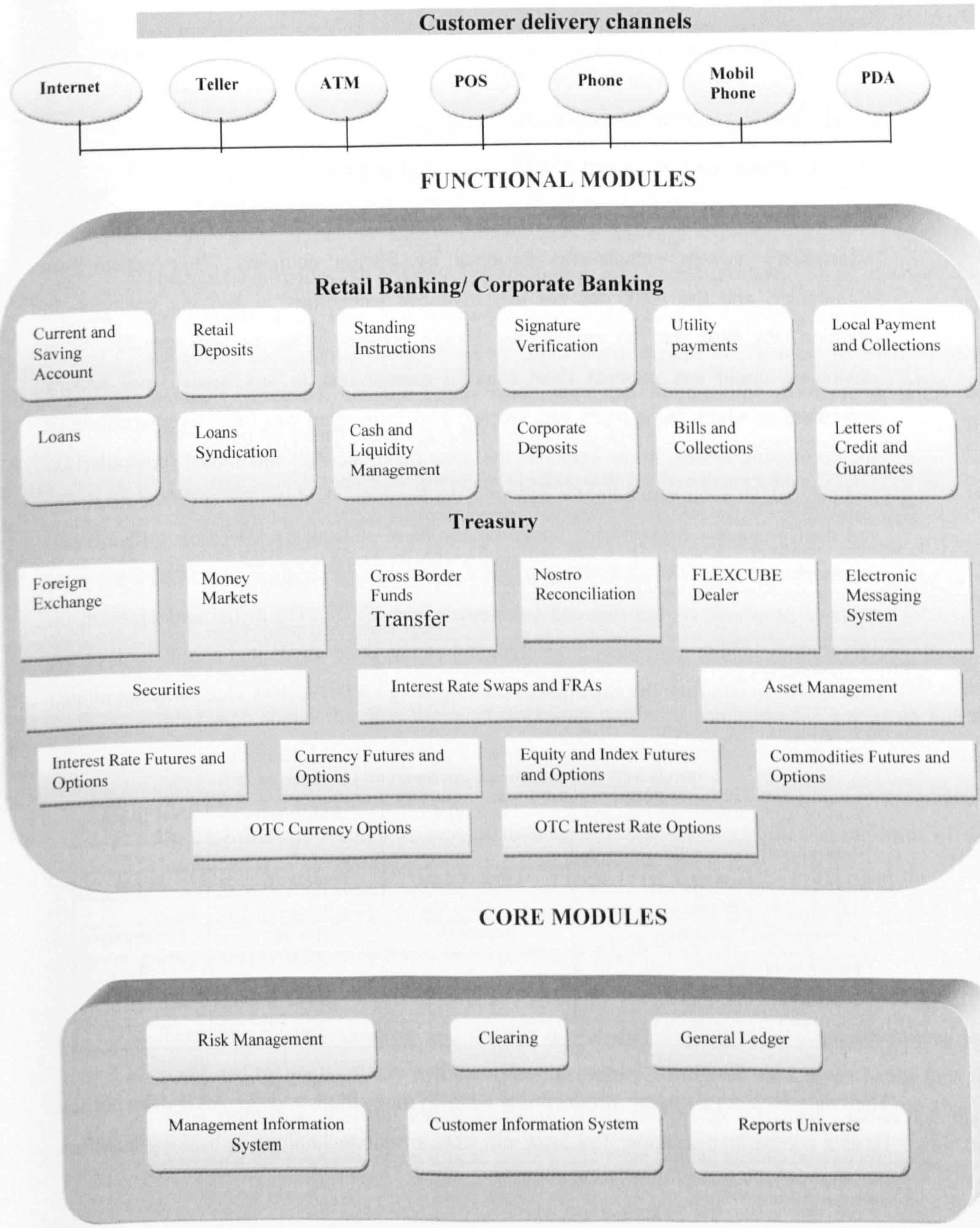
Linking Contracts to Deposits / Accounts

The entire contract amount or a portion of it can be linked to any number of deposits or account or to both. In addition, several LCs can be linked to the same deposit, provided sufficient funds are available in the deposit.

Contract Modifications

Contract Amendment can be done through the same screen as Contract Input. Adjustments to the contract can be made through the main screen with respect to an increase or a decrease, or an extension contract value.

Figure 5-16 FlexCube System (Wahda Bank) (Source: WB documents)



A nostro account is "an account owned by the host bank and maintained with a bank (usually) overseas" (M King, 2003)
FRA is a Forward Rate Agreement
OTC (Over-The-Counter) is a market for trading securities that are not listed on an organized stock exchange.

5.6.1 Case 3: Alegmaa Alarabi Bank (AAB)

5.6.1.1 Extent and Nature of AIS Investment at the AAB

The current AIS in the bank was introduced in 2006. The bank used a local AIS called Alesteshary System, which was designed by Libyan company. This system was elementary, and the bank did not use advanced technology in banking business. In addition, the bank had no networking linkage between branches and agencies. Thus customers could not conduct their banking transactions in any branch and agency regardless of where the account was located. However, there was full computerisation of the accounting system in the bank, on the other hand, the AIS was mixed (computerised and manual) in some functions for example, the branches' budgets are collected manually and then prepare a consolidated budget at the level of bank by Microsoft Office Excel (interviewee 11, p.293). According to the bank's balance sheet on 31/12/2009, the total value of programmes, systems and equipments was LYD 2,472 m (around £1,261m on 31/12/2009), which represents more than 3% of the fixed assets and about 0.7% of the total assets. In addition, the expenses of training were LYD 190,500 which was not related to training on the system.

Table 5-53 The nature and attributes of AIS in the bank

Age of Current AIS	1 to 5 years	5 to 10 years	Over 10 years
Interviewees Number		5	
Designer of the system	Local designer	Foreign designer	Mixed
Interviewees Number	5		
Implemented technology	Advanced	Average	Elementary
Interviewees Number			5
Computerisation of AIS	Computerised	Mixed	Manual
Interviewees Number	2	3	

The bank does not compete at the cutting edge of innovation, and the AAB does not use IT as a competitive weapon. The bank still uses a basic technology in banking business.

However, the AAB views IT as a critical and essential investment area and the management are seeking to develop the system in the future (see Table 5-54).

Table 5-54 AAB's use of IT

Statement	Yes	No
Competition at the cutting edge of innovation		5
Use IT as a competitive weapon		5
View IT as a critical and essential investment area	4	1

The system provides the required information to all internal users and to all levels of the management in an easy and accessible way. In addition, the system provides financial statements for external users. However, operational reports on business transactions are manually prepared. On the other hand there was no top line information (EIS) or information for board members (DSS) (see Table 5-55).

Table 5-55 Information generated by the accounting system

Types of information	Yes	No
Financial statement for external users	4	1
Managerial reports for internal users	5	
Operational reports on business transactions	5	
Statistical reports	5	
Top line information (EIS)		5
Information for board members (DSS)		5

Table 5-56 shows that that the most important problems and obstacles that arose during the operation of AIS were; delay of obtaining information; the system did not cover some banking activities; lack of data quality; and some operating malfunctions. The participants ascribed these problems; to lack of training and up-skilling; limited capabilities of the system; there was no network linkage between branches and head office; and there was even no linkage between devices at the same branch. In addition, there was another important problem, which was the support and operation of the system, because it was not owned by the bank.

Regarding the maintenance and support of the system, the system was maintained and supported by the company that designed the system. Moreover, all Libyan banks face the same problems, whereas these problems were related to the bank. However, these problems were specific to technical factors, and were related also to human element.

Table 5-56 The most important problems and obstacles

Problems and Obstacles	AAB1	AAB2	AAB3	AAB4	AAB5
Kinds of problems and obstacles	The availability of information, and lack of data quality.	Support and operation of the system	Some operating malfunctions	Some failures in the system, it does not cover some banking activities, and the system is rented	Delay of obtaining information
Maintenance and support of the system	Company which designed the system	Company which designed the system	Company which designed the system	Company which designed the system	Company which designed the system
Reasons of theses problems	Linkage between devices in the branches and lack of training	Support and operation the system	Interruption of communication	The system has limited capabilities. Lack of training and up-skilling	Non-linkage between branches
Exclusive to the bank or all Libyan bank	The bank	The bank	All Libyan banks	All Libyan banks	The bank
Related to human or technical factors	Human and technical	Technical	Technical	Technical	Technical

The system was simple and uncomplicated to use because it was not highly advanced, and the interface was in Arabic as shown in Table 5-57.

Table 5-57 Ease and simplicity of use of the system

Respondents	Yes	No	Why?
AAB1	√		Because it is not a highly advanced
AAB2	√		Because it is basic and not highly developed
AAB3	√		Because it is uncomplicated
AAB4	√		Because it is simple and in Arabic
AAB5	√		Because it is simple and uncomplicated

With reference to the main business area of the bank that IT projects were being used for, Table 5-58 shows that most of the bank's business activities were covered by IT project except some area such as ATMs, Visa cards, mobile banking and linkage between the branches which the bank does not provide. However, only some bank's business activities, such as treasury and current accounts were covered, because there were no core banking and data centres, and a networking linkage between the branches was required (interviewee 12, p .297).

Table 5-58 Main banking business area

Respondents	Main areas of business
AAB1	Most of bank's activities except some area such as ATMs, Visa cards, mobile banking and linkage between the branches.
AAB2	Some bank's activities.
AAB3	Most of currently bank's activities.
AAB4	Most of bank's activities except some area such as ATMs, Visa cards, and there is not the linkage networking between the branches.
AAB5	Some bank's activities such as treasury and current accounts activities.

Table 5-59 shows users the information and how often they used it as follows, 'managers in the bank' used the information most frequently (Rank 1), followed by 'bank's top executives/board members' (Rank 2). On the other hand, respondents said that 'tax department in the finance ministry' rarely used the information (Rank7).

Table 5-59 Users of the information generated by the AIS

Users	Yes	No	Frequency of the rank							Rank in total	
			1	2	3	4	5	6	7	*Average	Rank
Managers in your bank	5		2	2	1					1.8	**1**
Bank top executives/Board members	5		1	2	2					2.2	**2**
Operatives, controllers, office staff	5		1	1	1			1	1	3.8	**3**
Shareholders	4	1	1			1	1	1		4	**4**
Governmental bodies	5				1	1	2		1	4.8	**5**
Investors and creditors	4	1				2	1		1	5	**6**
Tax department in the finance ministry	5					1	1	3		5.4	**7**

*to rank the users, the frequency of the rank was given weight as following: Σ FR x R / RN, where FR= Frequency of the rank, R= Rank and RN= number of Respondents.

5.6.1.2 Investment in AIS, Business Processes and Business Performance at the AAB

AIS investment in AAB was fairly effective and efficient with respect to current banking business. Table 5-60 shows that the important benefits that could be gained from the efficient deployment of the AIS were: providing required information, and ease to use. However, there were obstacles which kept the bank from being more effective in its use of the AIS, which can be summarised as follows:

- Delay of obtaining required information.
- Capabilities of the system are limited.
- There is no linkage network between branches.

It is noted that all obstacles are the same as those mentioned in the first section, which arose during the operation of the AIS.

Regarding the assessment of the cost and benefits of the AIS, the AIS's benefits outweighed its cost, although the system needs to develop or change to obtain the benefits of AIS. With reference to the availability of the information, the system provides required information to internal users, but there was a delay in obtaining information.

Table 5-60 Assessment of the effectiveness and the efficiency of the AIS

Statement	AAB1	AAB2	AAB3	AAB4	AAB5
The important benefits that may be gained from efficient deployment of AIS.	It is not effective and efficient enough	It is effective and efficient because it is easy to use and provides required information	The system is effective in terms of providing required information	Fairly effective and efficient with respect to current banking business	The system is not effective and efficient
The obstacles that keep AIS from being more effective	The system capabilities are finite to deal with huge volume of data and it does not provide required information to internal users in time	Networking between branches	The linkage between branches	Capabilities of the current system are limited	It is simple and does not keep pace with the evolving banking
Evaluate cost /benefit of AIS	The cost of system is high and needs to develop or change.	Spending for IT is not enough to obtain the benefits of AIS	The benefits are greater than its cost	Its cost is not high compared with its benefits	Good compared with its cost
The availability of information to all users	Available to internal users	Available to internal users	Available to all users	Available to all users	Delay of obtaining information

Regarding the influence of investment in AIS on the bank's reputation in question 2, investment in AIS has a positive influence on the bank's reputation. this influence as follows; providing new and better services and thus increasing income and obtaining competitive advantage; providing quick and accurate information to management, investors and customers, and thus giving more confidence to the customers; and providing faster services and more convenience to managers to make a decision more accurately and on time (see Table 5-61).

Table 5-61 Influence of investment in AIS on the bank's reputation

Respondents	Influences
AAB1	Providing better services and thus increasing income.
AAB2	Providing new services and saving customers' time through speedy accomplishment of transaction.
AAB3	providing faster services and more convenience, hence obtaining a competitive advantage
AAB4	Providing quick and accurate information to management, investors and customers, thus it gives more confidence to the customers of the bank.
AAB5	Providing faster services and more convenience , and helping to provide information to decision maker on time

The current AIS is fairly effective in supporting managers especially in credit decisions. Interviewee 11 recommended that obtain good core banking, data base and linkage between branches, develop the system and participate of the NPS project, and use advanced IT (p.292). On the other hand, the current system was not effective in supporting managers in decision-making and problem solving because there was a delay of obtaining information, and recommended to change the current system with other more developed (see Table 5-62).

Table 5-62 Effectiveness of AIS in supporting managers in decision making and problem solving

Respondents	Effectiveness
AAB1	It is fairly effective in supporting managers especially in credit area.
AAB2	It is fairly effective in supporting managers especially in credit decisions.
AAB3	The system is consumedly effective in supporting managers especially in the credit decisions.
AAB4	The current system is good especially regarding to decisions of credit and investment.
AAB5	It is not effective in supporting managers in decision-making and problem solving, because there is a delay of obtaining information.

Because of the need to develop the AIS in response to the development and changes in the Libyan business environment, especially regarding the NPS project, the respondents were asked for their opinion regarding the need for further development. there was a significant need to develop the AIS and linkage networking between all bank branches and head office because there were some areas in the NPS project such as real time gross settlement system (RTGS) and automated clearing house (ACH) need obtaining more advanced system (see Table 5-63).

Table 5-63 Needs to develop AIS

Respondents	Need to develop
AAB1	There is a significant need to develop AIS; The management is seeking to develop the system because there are some areas in the NPS project, which should be applied by the bank.
AAB2	There is an urgent need to develop AIS
AAB3	It is necessary to convoy this development through developing the system and networking between branches
AAB4	There is a significant need to develop its IS in the bank and linkage networking between all bank branches
AAB5	There is an urgent need to develop AIS

AIS has an essential role in competition through providing good, fast and comfort services to the customers because the customers need now the speed accomplish of transaction regardless price of the service, thus the number of customer will be increased and the income will be increased as well. It also enables the bank to use new products and

improve existing services, and thus obtain competitive advantage among other banks and helping manager (see Table 5-64).

Table 5-64 Role of AIS in gaining competitive advantage

Respondents	Role of IT
AAB1	Providing good and comfort services, thus it leads to maintaining existing customer and obtaining new customers. It also enables the bank to use new products and improving existing services
AAB2	The customers need now the speed accomplish of transaction regardless price of the service, thus the number of customer will be increased and the income will be increased as well.
AAB3	It has a significant role in the competition, speed of transaction accomplishment and providing good services to the customers
AAB4	Saving time and effort, facilitates accomplishment of transactions, leads to obtain a new customers and investors, thus obtain a competitive advantage.
AAB5	it enables the bank to obtain competitive advantage among other banks and helping manager in decision-making

Currently, the level of AIS in the AAB was not enough to improve business performance because it did not meet the needs of external users such as customers and investors. The business performance could be improved by adopting developed AIS and investment in advanced technology. On the other hand the level of AIS system was sufficient in terms of the current banking, but in terms of customer services was not enough. Interviewee 15 suggested that development and training workforce at the first and then obtain advanced system (p, 312) (see Table 6-65).

Table 5-65 Role of AIS in improving business performance

Respondents	Role of IT	
	Level of IT is sufficient to improve business performance	**If it is not sufficient, how can it be improved?**
AAB1	It is not sufficient to improve business performance, because the bank cannot provide some banking activities.	The business performance can be improved by adopting developed IT.
AAB2	It is fairly sufficient to develop business performance.	It can be improved by investment in advanced technology.
AAB3	It is enough in terms of the current banking, but in terms of customer services is not enough.	Obtaining developed system.
AAB4	It is not enough for developing the business performance, because it does not meet the needs of external users such as customers and investors.	It can be improved by adopting advanced technology.
AAB5	It is not enough for developing the business performance.	Development and training workforce and then obtaining advanced system.

The effects of the upgrade in AIS infrastructure on the structure of the workforce and activities in the AAB can be summarised as follows; improving business performance; increasing banking business accuracy and increasing business activities; Improving

existing services and introducing new and convenient services; and providing huge volume of information (see Table 5-66).

Table 5-66 Effects of the upgrade in AIS infrastructure on structure of the workforce and activities

Respondents	Effects
AAB1	Increasing activities of business.
AAB2	Creating new banking activities and improving existing services.
AAB3	Improving business performance, increasing banking business accuracy and increasing business activities.
AAB4	Improving existing services and introducing new and convenient services.
AAB5	It provides huge volume of information, enables the bank to expand by opining new branches, and provides new services and developing banking business.

Regarding the impact of the upgrade of AIS infrastructure on banking transaction costs and the number of staff and branches, the banking transaction cost and number of staff decreased as a result of the upgrade of IS/IT infrastructure. However, the upgrade of AIS infrastructure has an effect on the number of branches when availability of good core banking, data centre and good communication infrastructure (interviewee 12, p. 297). On the other hand, there was no impact on the number of branches.

Table 5-67 shows that the most important factor that driving investment in IT in the bank was 'to increase and improve customer services' followed by 'increasing internal efficiency and cut service prices/lower service costs'. In the third rank was 'an increase in the understanding of customer needs'. On the other hand, the last two factors were 'increasing efficiency of business transactions' and 'create overall market growth' (create new demands) respectively.

Table 5-67 Factors driving investments in AIS

Factors	Yes	No	Frequency of the rank								Rank in total	
			1	2	3	4	5	6	7	8	*Average	Rank
Improve and increase customer services	5		4		1						1.4	1
Cut service prices/lower service costs	5			2		2	1				3.4	2
Increase internal efficiency	5			1	3			1			3.4	2
Increase understanding of customer needs	5			1	1	1	1	1			4	4
Market share growth (take from competition)	3	2	1			1			1		4	4
Defend current market share position	3	2		1			1			1	5	6
Increase efficiency of business transactions	5					1	1	1	2		5.8	7
Create overall market growth (create new demands)	5						2	1		2	6.4	8

*to rank the factors, the frequency of the rank was given weight as following: Σ FR x R / RN, where FR= Frequency of the rank, R= Rank and RN= number of Respondents.

The factors listed in the Table 5-68 that contribute to the success of the bank's AIS. The first factor was 'adequate funding', and in the second rank was 'the technical skills of IS staff members'. In the third rank was 'supportive bank management and users'. 'Partnering with external service providers' was the last factor with eighth rank.

Table 5-68 The factors contributing to the success of bank's AIS

Contributors	Yes	No	Frequency of the rank								Rank in total	
			1	2	3	4	5	6	7	8	*Average	Rank
Adequate funding	4	1	2	1		1					2	1
Technical skills of IS staff members	5		2	1			1	1			3	2
Supportive bank management/users	5			1	2		2				3.6	3
Alignment of IS and business strategies	5			1	2			2			4	4
Provide quality and innovation services to the customer	5		1	1			1		1	1	4.6	5
Reduce cost and errors	5					2		1	1	1	5.8	6
Customer service attitude towards ISs	5					1	1	1	2		5.8	6
Partnering with external service provider(s)	3	2			1					2	6.3	8

*to rank the contributors, the frequency of the rank was given weight as following: Σ FR x R / RN, where FR= Frequency of the rank, R= Rank and RN= number of Respondents.

The statements in the Table 5-69 below are the most important benefit of IT in the AAB, in the first rank was 'giving the bank a competitive advantage'. The second rank was 'providing a way for the bank to reduce costs'. There were two factors in the third rank, which were 'playing an integral role in meeting customer requirements' and 'assisting and supporting the needs of bank's businesses'. In the sixth and last rank was 'enabling the bank to increase revenues'.

Table 5-69 Benefits of IT

Statements	Yes	No	Frequency of the rank						Rank in total	
			1	2	3	4	5	6	*Average	Rank
IT gives your bank competitive advantage	4	1	1		2	1			2.75	1
IT provides a way for your bank to reduce costs	5		1	2		1	1		2.8	2
IT plays an integral role in meeting customer requirements	5		1	1	1			2	3.6	3
IT assists and supports the needs of your bank's business	5		1		1	2		1	3.6	3
IT is an important component and is aligned to your business strategy	5			2			3		3.8	5
IT enables your bank to increase revenues	5		1		1	1	1	1	4	6

*to rank the statements, the frequency of the rank was given weight as following: Σ FR x R / RN, where FR= Frequency of the rank, R= Rank and RN= number of Respondents.

All the items listed in Table 5-70 available to implement, support and develop AISs, and rank of these items in terms of availability as follows, in the first rank was 'providing enough funds for on-going investment in AIS', and the second rank was 'providing technical tools to develop and support AIS', 'providing outside specialist experts when required' was the third rank, and in the fourth and last rank was 'providing skilled personal to implement and support the AIS'.

Table 5-70 Items to implement, support and develop AISs

Items	Yes	No	Frequency of the rank				Rank in total	
			1	2	3	4	*Average	Rank
Enough funds for on-going investment in AIS	4	1	3	1			1.25	1
Technical tools to develop and support AIS	5		1	2	2		2	2
Outside specialist experts when required	5			2	3		2.6	3
Skilled personal to implement and support the AIS	4	1	1			3	3.25	4

*to rank the items, the frequency of the rank was given weight as following: Σ FR x R / RN, where FR= Frequency of the rank, R= Rank and RN= number of Respondents.

All the benefits of IT banking services listed in the Table 5-71 are evident in the AAB, and rank of the evident benefits as follows; 'IT banking services save their time' and 'IT banking services make their banking more convenient' in the first rank and the second rank respectively. 'Provide accurate accounting information' and 'easy to use IT banking services' were the third and fourth rank respectively. 'Provide privacy in their banking transaction in terms of the rank of respondents' was the fifth and last rank.

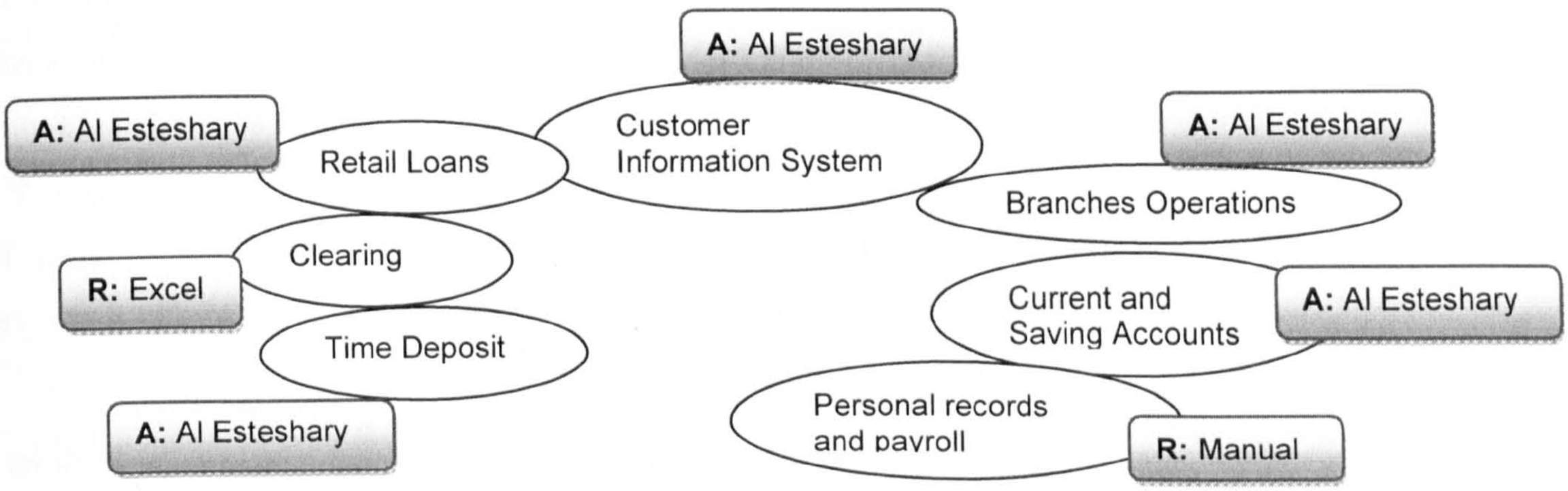
Table 5-71 Benefits of IT banking services achieved

Benefits	Yes	No	Frequency of the rank					Rank in total	
			1	2	3	4	5	*Average	Rank
IT banking services save your time	5		2	1	2			2	1
IT banking services make your banking more convenient	5		1	3		1		2.2	2
IT banking services provide accurate account information	5		2		1	1	1	2.8	3
It is easy to use IT banking services	5			2		2	1	3.4	4
IT banking services provide privacy in your banking transaction	5				1	1	3	4.4	5

*to rank the benefits, the frequency of the rank was given weight as following: Σ FR x R / RN, where FR= Frequency of the rank, R= Rank and RN= number of Respondents.

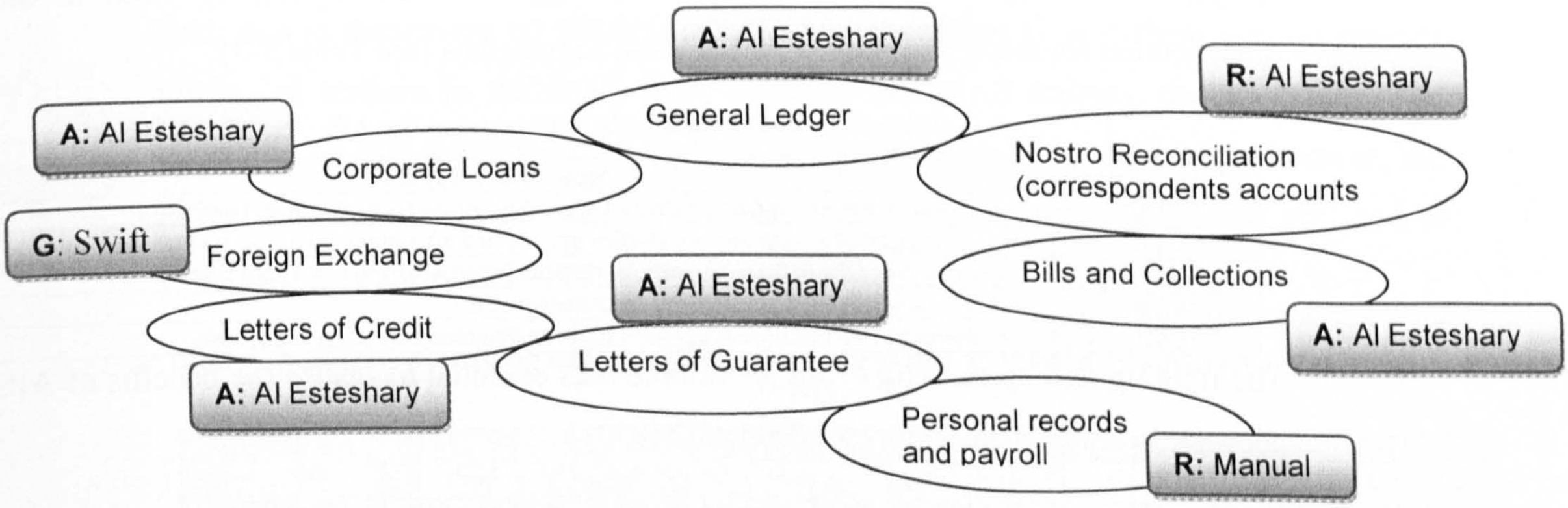
With respect to main business functions and IS profiling at the AAB, according to interviews that were conducted with relevant staff, bank documents and the researcher's observation, the AAB uses a local banking system in most of its business processes. This system has limited capacities, which keep the bank from being more competitive with other banks. There remain some semi-manual processes in the bank; for example the branches' budgets are collected manually and then consolidated for the bank as a whole in Excel spreadsheets. Overall, the Alesteshary package is little more than adequate in supporting some business functions, particularly in the running of the bank as a commercial entity (Figure 5-17). The system may need replacing or development in some business areas, such as customer IS, bills and collections, general ledger and retail loans. In addition, in some activities (HR Management and Financial Management) the system is manual and defective and needs replacing by other advanced systems. On the other hand, the bank uses the Swift system for foreign exchange activity and this system is currently sound and may not need replacing.

Retail Business



Notes: Al Esteshary is a local banking system and has limited capacities. G (Green) = indicates a system that is currently sound and may not need replacing. A (amber) = indicates a system that may need replacement. R (red) = indicates a system is defective and need replacing.
Al Esteshary is a local Libyan company

Corporate Business



Notes: Al Esteshary is a local banking system and has limited capacities. G (Green) = indicates a system that is currently sound and may not need replacing. A (amber) = indicates a system that may need replacement. R (red) = indicates a system is defective and need replacing.

Figure 5-17 Main Business Functions and IS profiling at the AAB

(Based on methodology developed by Wynn et al, 2009)

5.6.1.3 The Importance of Training and Up-skilling the Workforce at the AAB

The AAB's employees were trained during their operation to the system and the employees have not had any training regarding the system. In general, the employees were satisfied with the system because it was not developed enough and it was simple. However, the senior management was not satisfied and needs more developed system to meet its requirement. Regarding assessment to the training and up-skilling of the workforce programmes and policies, majority of respondents were agreed that there were no training programs and up-skilling in IT see Table (5-72).

Table 5-72 Assessment of the training and up-skilling of the workforce programmes and policies

Respondents	Where were the employees trained?	Who trained them?	Are the employees satisfied?	Assessment of programmes and policies
AAB1	During operation of the system		Satisfied	There are no training programmes
AAB2	During operation of the system		Satisfied	There are no training programmes
AAB3	During operation of the system		Satisfied	There are no training programmes
AAB4	During operation of the system		Satisfied	It is not as must be
AAB5	During operation of the system.		Satisfied	There is no training policy

As regards the role that employees play in improving the AIS, the employees have a role to improve the system by submitting their suggestions by suggestions form to the management for study and implementing these suggestions (see Table 5-3).

Table 5-73 Employees' role in improving the AIS

Respondents	Role of employees
AAB1	Through submit their suggestions to add or modify some reports for more details
AAB2	There is suggestions form that are studied and applied after approval of the management
AAB3	The employees submit their suggestions through proposals form to the management
AAB4	Through submit their suggestions to the management
AAB5	The employees submit their suggestion to the management by suggestions form

The training and up-skilling of the workforce was essential to realise the benefits of AIS adequately and satisfactorily (see Table 5-74).

Table 5-74 Need of training and up-skilling of the workforce

Respondents	Extent of need		
	Very required	**Neutral**	**Not required**
AAB1	Very required		
AAB2	Very important		
AAB3	Very required		
AAB4	Very important		
AAB5	Required		

There was a complete agreement among the respondents that skilled employee in IT is very important to improve business performance (see Table 5-75). Moreover, employee

skills levels can positively influence business performance through a speed of transaction accomplishment. The skilled employees in IT avoid a lot of problems during operation of inputting data. In addition, the employees' skills make tasks of supporter easer, and thus save effort and time, and improve business performance through a speed of transaction accomplishment, and they provide required information on time, these lead to decreasing of transaction cost.

Table 5-75 Employees' skills in IT

Respondents	Help of employees' skills in IT
AAB1	Employees' skills help to improve business performance through a speed of transaction accomplishment. The skilled employees in IT avoid a lot of problems during operation of inputting data.
AAB2	Employees' skills are very helpful to improve business performance because it makes tasks of supporter easer, and thus saves effort and time, and improves business performance
AAB3	There is positive relationship between employees' skills and business performance through their good using and dealing with the IS.
AAB4	Employees' skills help to improve business performance and saves time and effort of employees in terms of raising speed, accuracy and efficiency
AAB5	Skilled employees help to improve business performance through a speed of transaction accomplishment, and they provide required information on time, these lead to decreasing of transaction cost.

The impact on the delivery of the benefits of investing in IT has a positive impact on efficiency of employees and increasing a speed completion of transactions. On the other hand, due to there were no training programmes regarding IT and there was no enough number of trainers in the bank, there were no effects of training and up-skilling the workforce on the delivery of the benefits of investing in IT in the bank. However, the current training and up-skilling suffice the current requirements, but it did not lead to development of banking business (see Table 5-76).

Table 5-76 Effects of training and up-skilling of the workforce on the benefits delivery of investment in AIS

Respondents	Effects of training and up-skilling
AAB1	Training and up-skilling has a positive impact on efficiency of employees and increasing a speed completion of transactions
AAB2	there are no effects of training and up-skilling the workforce on the delivery of the benefits of investing in IT in the bank
AAB3	Training and up-skilling has a positive impact, where it leads to increasing efficiency of employees and improving business performance
AAB4	the training and up-skilling has a positive impact on the delivery of some benefits of investing in IT
AAB5	The current training and up-skilling suffice the current requirements, but it does not lead to development of banking business

All the mentioned benefits in the Table 5-77 were delivered by the training and up-skilling of the workforce. Regarding the most important benefits, the majority respondents gave

'improve customer services' the first rank. There was a little difference between 'raise the capacity to deal with the growth in number of transactions' and 'reduce a number of errors', which were the second and third respectively. In the fourth rank was 'improve competitive advantage of the Bank'. On the other hand, the less important benefits were 'improve competitive advantage of the Bank' and 'reduce the number of employees of the bank' at the sixth and seventh rank respectively.

Table 5-77 Benefits of the training and up-skilling of the workforce at AAB

Benefits	Yes	No	Frequency of the rank							Rank in total	
			1	2	3	4	5	6	7	*Average	Rank
Improve customer services	5		2	1	1	1				2.2	1
Raise the capacity to deal with the growth in number of transactions	5		1	1	2	1				2.6	2
Reduce a number of errors	5		1	1	1	2				2.8	3
Improve working conditions and competition	4	1	1	1			1		1	3.75	4
Improve the accounting control in terms of accuracy and recording transactions	4	1		1	1			1	1	4.5	5
Improve competitive advantage of the Bank	4	1					2	2		5.5	6
Reduce the number of employees	4	1					1	1	2	6.25	7

*to rank the benefits, the frequency of the rank was given weight as following: Σ FR x R / RN, where FR= Frequency of the rank, R= Rank and RN= number of Respondents.

5.7 Comparison between the three case studies

The CDB has a well developed AIS software package, and uses modern IT in much of the banking business – and was one of the pioneers in this regards in Libya. The CDB was the first bank in Libya to issue Visa cards, and use ATMs, points of sale, electronic banks and mobile banks. Compared with other Libyan banks, the CDB is advanced in its use of information technology. However, the use of this developed technology is still weak as a result of a lack training programs and shortage of skilled staff in IT as well as inefficiencies relating to the poor communication infrastructure in Libya. There are no clear policies or plans for training at a regional, national or corporate level and so training has little positive impact on the delivery of the benefits of investing in IT. The most important problems that the bank faces are related to human resources, where there are no specialists in technology in the field of accounting. Consequently, the management hires experts from outside the bank to support and maintain the system. In addition, a lack of a communications infrastructure in the state is one of the most important problems that face all Libyan banks.

In general, The WB has adopted and deployed a well developed AIS system in last few years, and this system covers all banking business functions. However, the bank now does not use all the capabilities of the system because it is in some regards too advanced and modern for the employees. The most important problems and obstacles that have arisen in the operation of FLEXCUBE are shortfalls in the availability, accuracy and quality of information. These problems come from the incomplete installation of the new system in all branches and a lack of qualified and skilled staff to operate the system. Questionnaire respondents also highlighted the lack of communication infrastructure in the country as a whole. The CBL has encouraged Libyan banks to develop banking technology and service development through the NPS strategy to enable them to compete with foreign banks, to provide the same services at the same service level. Despite the problems discussed above, this has enabled the bank to some extent to use new products, keep up with the competition, maintain existing customers, obtain new customers and develop its services; but clearly, there remains considerable scope to improve in these regards..

The AIS that is used in the AAB is basic and not effective and efficient enough and there is a significant need to develop the AIS and linkage networking between all bank branches in response to the development and changes in the Libyan business environment, and to improve business performance. Due to the system having limited capabilities, sometimes there are failures in the system, which cause confusion in the banking, and it does not cover some banking activities. Another problem is that the system is rented, and is not the property of the bank, therefore, the bank depends on the company that designed the system in terms of support and maintenance the system. In addition, there are not any training programmes in the bank regarding information technology. The continued training and up-skilling is a significant need to realise the benefits of AIS adequately and satisfactorily. Nevertheless, AAB management view IT as a critical and essential investment area and are seeking to develop the system in the future. Despite its limited functionality, the system is relatively user friendly and accessible for internal users, and provides financial statements for external users. However, operational reports on business transactions are manually prepared. There was no top line executive information (EIS) for senior managers or board members.

Chapter 6:
Cases Study Analysis

Chapter 6 : Cases Study Analysis

6.1 Introduction

Chapter 5 presented the data gathered from this study. In turn this chapter will summarise the overview and findings of the current study by representing the background of the current research, a summary of its objectives, and a discussion of the findings with respect to the developed theoretical framework.

Specifically, the chapter contains the following parts:

- Analysis of the main findings and recommendations;
- Conclusions regarding the research questions;
- Main research contributions to knowledge;
- Research study limitations; and future research;
- Conclusion regarding the research aim.

The findings of this thesis indicate that in general, the investment in IT in the banking business in Libya is very important and essential to benefit from advantages of IT, especially after allowing to foreign banks to open branches in Libya and increasing a competition among Libyan banks to provide modern and developed services to customers. Therefore there is a general trend among Libyan banks towards utilisation of modern technology in their business, because it also it plays an important role in economic development, and skilled training is an essential element to obtain the benefits of this investment.

6.2 AIS Investment in Libyan Commercial Banks

In Libyan commercial banks, IT investment is still in its infancy compared with most developed countries. However, in the last few years there has been, and still is, a significant concern need by Libyan banks to invest in IT, This especially after opening the doors to foreign banks to invest in Libyan banks and open their branches in Libya as well as some private Libyan banks adopting advanced systems in banking business. Thus the competition has arisen among the banks to achieve a bigger share in the Libyan banking business through providing the latest and easier to use services towards the customers by using developed IT. In the context of the Central Bank of Libya (CBL) there is a trend towards increasing the benefits of the large developments of information technologies and

improving the banking activity environment. The Central Bank of Libya and five of the largest public commercial banks in Libya jointly started implementing an ambitious program for technological developments in the area of IT in the National Payment System. This program was preceded by approving a plan, set by a committee of experts in the banking activities. This plan's objective is to formulate a strategy that ensures efficiency, effectiveness and safety for the developments of a national payment system to contribute to the development of financial and other economic sectors. To execute this project, contracts with international companies were concluded. (See Chapter 2 for more details).

The main findings of this research related to AIS investment in Libyan banks, include the following:

- Prior 2004, there was a lack of developed IT in Libyan banks. However, recently there is a general trend of the Libyan banks toward investment in advanced IT with consequent benefits; this trend is in the public and private banks equally except some small private banks such as the AAB, which have not benefited from such increase in investment.

- As regards Nolan's model, The WB has probably made most progress, advancing from a position of having no centrally maintained information systems in 2007 to an integrated Oracle based package (FLEXCUBE and Oracle HR/Payroll) in 2010. This has been driven by the CBL and the implementation process has been similar in some regards to the installation of a standard ERP package in a large national or multi-national corporation. This should provide a sound technological platform for future growth and a key challenge will now be to utilise the software more effectively. At the CDB, the MISYS AIS has been implemented effectively to support some processes, but others remain manual or semi-automated. These areas include customer management, human resource management and loans management. In 2004, the CDB was arguably ahead of the WB, but in 2011, the bank is still struggling to achieve integration of the mix of technologies that support its key process functions, although some centralised control and strategy is now in place. The AAB has moved from a position of having largely manual or semi-manual functions in 2006 to a position where at least there is control over technology utilisation, with the Alesteshary AIS providing adequate

support for some functions, but with many others remaining manual or poorly supported (Figure 6.1).

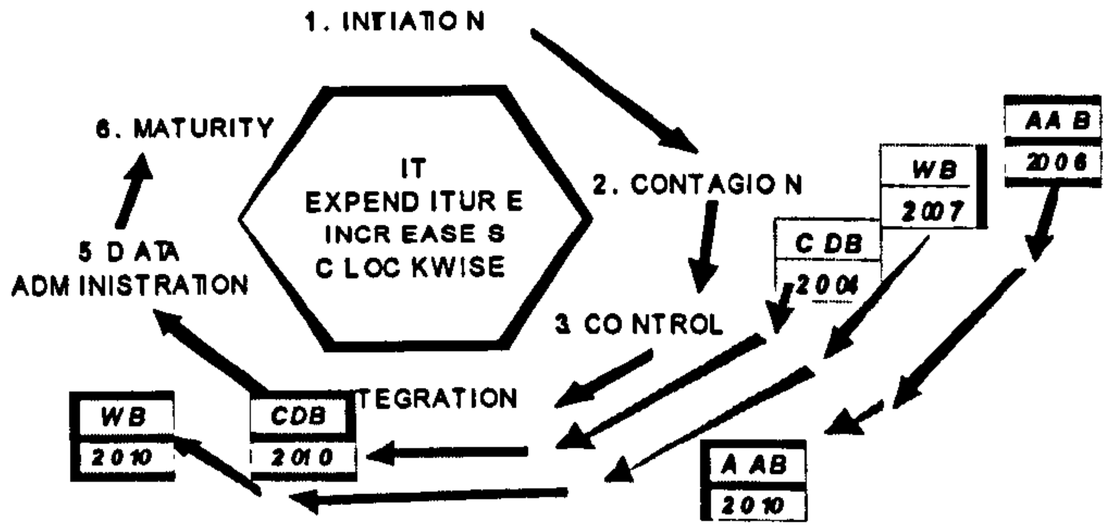


Figure 6-1 Progression of the three banks against Nolan's model

- According to documents of the CDB dated 31/12/2009, the total cost of investment in IT was LYD 4.437m. This figure involves banking system (MISYS system), secondary systems such as mobile banking, Microsoft programmes and network linkage. This investment represents about 8.8% of the bank's total invested capital. On the other hand, the total cost of investment in IT in the WB was LYD 6.795 m. This figure involves supply, installation and support of banking systems (FLEXCUBE system), supply and installation of secondary systems such as RTGS, ACP, ATM, POS, CMS, and Computers. This investment represented about 6.3% of invested capital (see Table 6.1).

Moreover, in the Commerce and Development Bank, the rate of return on equity (ROE) in 2007, 2008 and 2009 was 14%, 21% and 16% respectively. Comparatively, with the WB in 2007, 2008 and 2009 the ROE was 14%, 12% and 18% respectively (see Table 6-2). The amount of net income returned as a percentage of shareholders equity. Return on equity measures a corporation's profitability by revealing how much profit a company generates with the money shareholders have invested. ROE is expressed as a percentage and calculated as: Return on Equity = Net Income/Shareholder's Equity These ratios support the views of respondents from CDB that there is a large investment in the IT area compared with Wahda bank, based on the ratio of investment

in technology to the bank capital as mentioned above. Owing to the fact that the bank works among banks that have greater capital and have more banking experience, the bank views IT as a critical and essential investment area. The bank also keeps pace with new development in the area of IT and tries to apply them to Libya; therefore the bank is distinguished from other banks in this area.

Table 6-1 Ratio of Investment in IT to the Capital in CDB and WB (2009)

Banks	Investment in IT (MLYD)	Invested Capital (MLYD)	Ratio of Investment in IT to the Capital
CDB	4.437	50	8.8%
WB	6.795	108	6.3%

Source; CDB and WB annual reports of 2009 and documents

Table 6-2 Return on Equity (ROE) in CDB and WB

Banks	Net Income (MLYD)			Shareholders' Equity (MLYD)			ROE %		
Years	2007	2008	2009	2007	2008	2009	2007	2008	2009
CDB	10.572	20.152	15.583	75.896	95.263	100.141	14%	21%	16%
WB	31.738	29.491	48.674	226.119	245.059	273.089	14%	12%	18%

Source; CDB and WB annual reports of 2008 and 2009

- The Central Bank of Libya (CBL) and the commercial banks jointly started implementing an ambitious program for technological developments in the area of IT in the National Payment System and use an advanced banking system, which is called the FLEXCUBE Banking System, which was designed by a global foreign company. However, the CDB (private bank) has used a global AIS that is called MISYS, which was also designed by a global foreign company (the UK). According to most respondents' answers, all systems are easy and simple to use with training. Moreover, in these banks most of banking business activities have been covered by IT projects by obtaining developed ISs.

- Due to the use of advanced banking systems in Libyan banks in its infancy and as these systems are very complex and very developed and need qualified and skilled staff; the banks now do not use all their capacities and do not benefit from these systems in a satisfactory manner and adequate.

- Some of private banks such Commerce and Development Bank; there is a large investment in the IT area. Owing to the fact that the bank works among banks that have greater capital and have more banking experience, the bank competes at the cutting edge of innovation use IT as a competitive weapon, and view IT as a critical and essential investment area; therefore the bank is distinguished from other banks in this area, and has a good reputation among Libyan costumers as results of IT investment. Porter and Millar (1985) have observed that the IT is influencing the competition through creating competitive advantage by giving companies new ways to outperform their rivals by lowering costs. The CDB was the first bank in Libya to issue a Visa cards, and use ATMs, points of sale, electronic banks and mobile banks. On the other hand, the public banks that compete at the cutting edge of innovation, view IT as a critical and essential investment area because the investment in IT in the banks as requirements of the NPS project, which is imposed and sponsored by Libyan Central Bank and the bank's management did not have a decision to invest in this project.

- According to Romney and Steinbart (2003) AISs (AIS) provide valuable information to a range of external users and internal users of accounting data. Cushing and Romney (1987) also stated that the main role of AIS stems from providing required information to users outside an organisation such as, current and prospective investors, creditors and governmental bodies, and the six major external interest groups that receive information from the business organisations are customers, suppliers, stockholders, employees, lenders, and government. This study found that in all Libyan banks, AISs provide required information to all internal and external users and to all levels of the management. However, generally, the provision of executive and decision support information is limited. In addition, in three cases the most frequent users of information were top executives/board members, shareholders, governmental bodies and tax department in the finance ministry respectively. In the CDB, a result of linkage network between the head office and all branches, the system provides required information to all levels of management in an easy and accessible way. Board members every day receive reports of the financial situation and daily activities of the bank and its branches.

- All Libyan banks face the same problems during the operation of the AIS, which are; Lack of qualified and skilled staff; lack of culture of customers to use technological services because there is no good services marketing; lack of training and up-skilling of the workforce; and lack of communications infrastructure in the country. The banks cope with this problem by hiring experts from outside the bank because there are no IT specialists in the banks and there is a lack of training on the system.

6.3 Business Process Change and Business Performance Improvement

The findings showed that the banks that use developed global systems have efficient and effective systems, compared with the banks that use local systems. For example, by using packaged software like MISYS and FLEXCUBE, managers can identify all business processes that are carried out by branches at any time and get a report about all their activities during the day. With the old systems, this process was not possible and needed the time and effort of more than one staff member to be manually collected and prepared, which affected cost, accuracy, validity and timeline of the information. In addition, there is a possibility to link and deal with other systems such as mobile bank and the SWIFT system. There are main important benefits gained from efficient deployment of AIS. For example, accurate information is available on time and easily accessed by all internal users and important information to external users is available in time, time and effort are saved, information can be provided to the management for decision-making easily and accurately, the quality of data is ensured, it can accommodate any new activities, and it can improve bank performance. In addition, the majority of respondents agreed that the AIS's benefits outweigh its cost, and there is substantial saving through the use of IT, especially in the long term. Laudon and Laudon (2005) indicated to some of these benefits where stated that use ISs to services at a lower price than competitors while enhancing level of service, and use ISs also provide new products and services, and significant change the customer convenience in using existing products and services.

On the other hand, there are main obstacles that keep the banks from being more effective in its use of AIS whish are, there is lack of staff's efficiency, there is a lack of training and up-skilling of the staff, there is a lack of appropriate culture amongst customers to use technological services because there is no good service marketing, and in the banks that adopted the NPS project, there are delays in data entry and lack of communications.

The key general findings of this thesis are described in the following section.

- Investment in IT has five main positive influences on Libyan banks' reputation. These influences consist of increasing bank customer numbers and income; increasing speed of completion of transactions; helping banks to achieve their goals; creating new services and improving extant services; and obtaining a good reputation, which strengthens bank competitiveness.

- Due to the fact that linkage between the branches has not yet been completed in most Libyan banks, the current AISs are not very effective in supporting managers in decision-making and problem-solving. In addition, because the deployment of advanced systems is still in its infancy in Libyan banks in general, the new systems have not yet been used in all branches and the banks now do not use all their capacity. This might lead to delays in the preparation of information needed for right decision making on time.

- Some Libyan private banks need to change their current systems to make them more developed to support management in decision-making and problem-solving. Some Libyan private banks have developed their systems and obtained advanced systems (such as the CDB). On the other hand, some banks (such as the AAB) have a significant need to develop their systems in response to development and changes in the Libyan business environment. However, most Libyan banks have changed their systems in line with this development and they are also one of the participants of the NPS project (such as Wahda Bank).

- There is considerable interest among Libyan banks in the area of investment in IT due to its important role in competition both between Libyan banks and between Libyan banks and foreign banks. In addition, due to the openness to competition of the Libyan banks from foreign banks, the Central Bank of Libya led Libyan banks to develop banking technology and service development; therefore it adopted the NPS strategy to enable Libyan banks to compete with foreign banks to provide the same services at the same level. Moreover, most services are similar in all Libyan banks but IT makes a difference in the means of providing these services. This leads to increasing customer numbers and maintaining existing customers, providing new and

fast services with less effort and cost, and thereby increasing the bank's revenues. Thus these will give a competitive advantage to the bank. Laudon and Laudon (2005) believed that, through reducing costs of obtaining and analysing information, IT allows organisations to reduce agency costs, because the supervision of a greater number of employees becomes easier for management. As a result of reducing the number of employees, IT allows organisation to increase revenues.

- In general, the deployment of AISs in Libyan banks could have greater impact on improving business performance through the following: completion of networking linkage between branches in some of the Libyan banks; good training and up-skilling of employees; reaping the benefits of knowledge experience of advanced foreign banks in this area; and the development of the communications infrastructure. IT has a significant role in improving business performance in Libyan banks. It has simplified and reduced procedures; it has reduced costs and time; it has provided accurate and timely required information; it has supported decision-making and problem solving; it has provided new services and improved existent services; it has improved the speed and accuracy of transactions. Lloyd-Walker and Cheung (1998) pointed out that in the banking industry, IT can help the providing of superior customer services by providing a fast, accurate and reliable service.
- An analysis of some respondents' views revealed that some managers do not make appropriate use of the information and data that has been provided by advanced systems. This may be due to the massive development of these systems compared with the abilities and qualifications of managers, who are non-accustomed to dealing with the vast amount of information produced by these systems.
- The upgrade of IS/IT infrastructure in Libyan banks has led to the following; reducing time of transactions accomplishment through a decrease in the number of procedures; providing new banking products and activities where there is now a possibility to link and deal with another systems for providing new services such as Swift system and mobile banking system ; supporting security of system; saving time and effort because there are some business do not need significant effort or number of staff, such as preparing of daily activities report about the branches, it just needs one staff and push of a button; helping managers to assess performance of the employees;

increasing banking business accuracy and increasing business activities; and improving and developing quality of banking services, thus improving employees' performance and banking business performance because most business is done by developed technology and not dependent on the human element, thus led to reduction the number of staff and cost of transactions in some business in most Libyan banks such as number of cashiers have been reduced after use of ATMs from 4 or 5 to 1 or 2 cashiers at each branch. This result corresponds with Holden and El-Bannany (2004) which concluded that ATMs have a positive effect on bank profitability by for example, reducing labour and transactions costs, and there are several studies that conclude that investment in ATMs leads to a reduction in banking transaction costs, and the number of staff and branches. However, the upgrade of IS/IT infrastructure in most Libyan banks has had no impact on the number of branches which depends on a separate feasibility study.

- The most important factors driving investment in IT in Libyan banks are: increasing and improving customer services, increasing internal efficiency, cutting service prices and lowering service costs, and increasing understanding of customer needs. These factors correspond with Porter and Millar in their study (1985) that banks are tending to use IT to improve the quality of their services, increase efficiency and customer satisfaction, and offer wider choices with lower costs to the customer. In other words, banks are using IT for competitive advantage. It can be observed that these factors are more related to customer services, thus obtaining a competitive advantage through providing good services at lowest prices and less time. Turner (1994) also stated that the electronic systems of transferring money and accounting information result in more efficiency, less mistakes, better control, a reduction of managerial costs to the minimum and the achievement of efficiency in accounting and rapid modernisation of accounting records.
- Major contributory factors to the success of IT in Libyan banks are technical skills of IS staff members, and supportive bank management and users. On the other hand, a less significant contributory factor is partnering with external service providers, which shows that there is a lack of relationships with advanced foreign banks or IT experts in this area.

- The most important benefits of IT to Libyan banks are; it gives the bank a competitive advantage; it enables the bank to increase revenues; it provides a way for the bank to reduce costs; it saves time. It enables AIS to provide more accurate information; it makes banking services more easy and convenient. Porter and Millar (1985) have confirmed that customers usually look for more convenient ways of dealing with their companies, while companies look for innovative and effective methods to reach their customers. In resorting to IT. These benefits are tangible in Libya, and the fact that the CDB was the first bank to invest in IT in Libya, gave the bank a good reputation and a competitive advantage among other banks, which reflected positively on the growth of the bank and increased the number of clients and the spread of its branches in Libya in a very short period.

- Libyan banks provide enough funds for on-going investment in AIS, and technical tools to develop and support AIS. However, in Libyan banks, there is a lack in providing outside specialist experts when required and providing skilled personnel to implement and support the AIS.

Owing to the CDB was the first bank in Libya to invest in developed IT related to banking business, for example, the issue of Visa card, and use of ATMs, point of sale, electronic banking and mobile banking. The following discussion will focus on the improvement of banking processes in the Commerce and Development Bank. This improvement is represented in the following developments.

- Customer deposits in the form of current debtor accounts in Libyan Dinars and foreign currencies for individuals and organisations on 31/12/2009 amounted to 1,784,231,322 LYD, an increase of 419,369,728 LYD over the year ended on 31/12/2008, which totalled 1,364,173,861LYD, at a rate of increase of 31%.
- Number of accounts on 31/12/2008 amounted to 127,573 accounts, an increase of 9,373 accounts over the year ended on 31/12/2007, which totalled 118,200 accounts, at a rate of increase of 10%.
- In 2009 increased demand by customers for conducting money transfers through Western Union, using 28 branches and agencies, an increase of 5 more retail outlets over 2007. This service is now available in all the Bank's branches and agencies for

the first time. The money transfers service reached 482319 transfers, realising a return of 6,404,756 LYD, compared to 1,764,700 LYD and 4,224,463 LYD in 2007 and 2008 respectively, an increase of 2,459,762 LYD in 2008 and 2,180,293 in 2009, an increase of 129% and 52% respectively as a result of these operations up to 31/12/2008.

- The following is an illustration indicating outward and inward money transfers through Western Union for money transfers in 2009 in comparison to 2007and 2008:

Table 6-3 Money transfers through Western Union in 2007, 2008 and 2009 (CDB)

Item	2007	2008	2009	Variation rate (2008)	Variation rate (2009)
Outward Transfers No.	86693	218614	395816	152 %	81%
Inward Transfers No.	26240	60368	86503	130 %	43%
Total no. of Transfers	112933	278982	482319	147%	73%
Outward Transfers Value (LYD)	62,542,284	154,624,095	273,541,375	147 %	77%
Inward Transfers Value(LYD)	23,580,622	54,224,611	60,116,370	130 %	11%

Source: CDB annual reports of 2008 and 2009

- Connectivity of all Bank branches and agencies has been completed through fibre optic network on 1/7/2008. This feature enabled the bank's customers to conduct their banking transactions in any branch or agency regardless of where the account is located. The completion of connectivity makes the Bank of Commerce and Development the first Libyan bank to connect all its branches and agencies with a single banking system through fibre optic network and satellite connectivity.
- The SWIFT system hardware and software have been modernised and developed by introducing automation in the execution of transfers through this system, by connecting all branches and agencies to the system's central location. Data is entered and financial transactions are conducted in the branch, then they are transferred to the central location at Head Office to execute the transfer. This method has saved a great deal of time, and reduced the expenses of stationary and communications.

- The Bank's own Intranet project was launched and connected to MISYS System. The purpose of Intranet is to raise employees' competency and facilitate the banking business.
- The bank started using the intranet connected to the MISYS Banking System enabling its users to obtain reports and data on the bank's customer accounts.
- The Bank continued to issue various types of electronic cards (VISA Gold - VISA Electron –VISA internet – Tourist VISA), Kanze local card. The number of issued cards of various types as at 31/12/2009 reached 35249 compared to 10344 for 2008, a rate of increase of (240%).
- The number of ATM's and POS machines was increased all over Libya. The number of Automatic Teller Machines distributed around the Bank's branches and agencies, hotels, commercial centres and airports reached 60 in 2009, compared to 48 in 2008, an increase of (25%).
- Among the differentiated services provided by the Bank to customers were, Mobile Banking Service subscribers rose to 43138 subscribers at the end of the 2009, compared to 13391 in 2008, a difference of 29747 subscribers and a rate of increase of 222 %. The number of electronic Banking users rose to 2576 users compared to 1386 in 2008, a difference of 1190 users and a rate of increase of 86 %.
- Preparation of the SWIFT was completed enabling the SWIFT Section to post inward foreign transfer directly and automatically to customer accounts and inform branches and agencies accordingly. This is a solution to the delay in posting inward transfers using regular mail.

Regarding process change engendered by new AIS, Zuboff's concepts of automate-infomate-transfomate (Zuboff, 1984) can be used in combination with elements of the CPIT model to allow top-level process models to be worked up for each bank providing a new X-Y axis for analysis (Figure 6-2). In this context, 'automate' signifies the basic use of computer systems to support a process; 'infomate' implies that the information system is being used to generate management and operational information to advance process improvement; and 'transfomate' means the deployment of the information system has had a major change on the business process leading to a degree of

transformation. These are to some extent subjective assessments, but backed up by observations and illustrations and questionnaire feedback.

The CDB has benefited from several years of bedding in the MISYS system in some key process areas, but other processes remain unsupported by modern technology. However, other advanced technologies are deployed, particularly for communications, including the Real Time Gross Settlement (RTGS) system for local letters of credit and SWIFT for external letters of credit. These systems do not need replacing, but there is a need for more training and up-skilling of the workforce to enhance the benefits of these systems. Some business processes and banking activities, such as corporate and retail loans and human resources, remain largely manual, and need development. In addition, there are activities which use basic software such as Excel in some business processes, such as time deposit and clearing, and these systems may need replacing by other more advanced software.

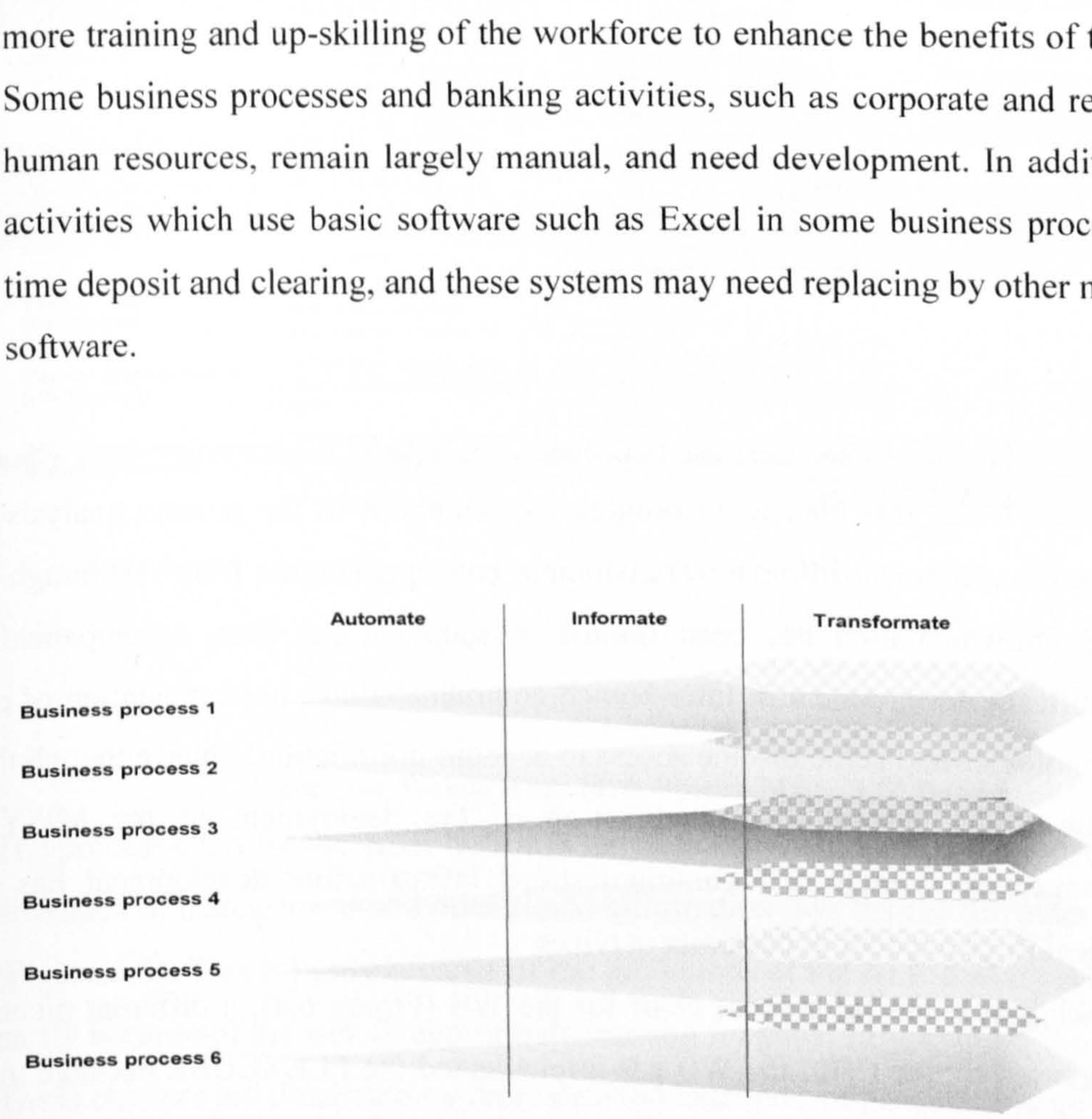


Figure 6-2 The CPIT/Zuboff model used for process analysis (A-I-T)

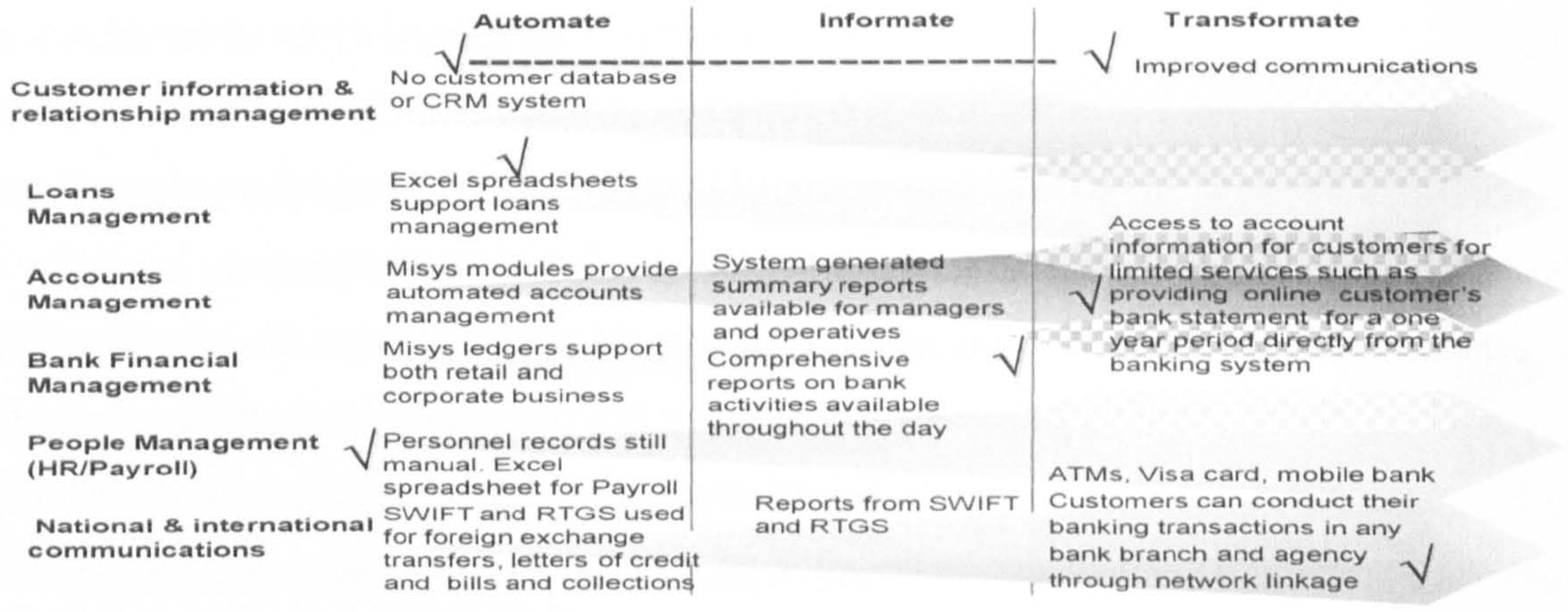


Figure 6-3 Commerce and Development Bank 2010: Process Map – AIT assessment

For the CDB, this checkered progress is evidenced in the process analysis chart using Zuboff's Automate-Infomate-Transfomate concepts (Figure 6-3). Although the MISYS AIS implementation has been limited in scope, it has been accompanied by a very significant development in inter-branch communications, implementation of point of sale technologies and some on-line access to account information. Thus, although there is no in house CRM system, the combination of the deployment of the MISYS accounts management module and communications infrastructure development has produced a radical improvement in customer services.

Looking at a similar process chart for the WB (Figure 6.4), a different picture emerges. Supported by the CBL, the WB has implemented the FLEXCUBE package more broadly across its main processes, complemented by the Oracle HR/Payroll package. This has provided the basic automation of the bank's main processes, but progress beyond simple computerisation has been limited. The lack of training and systems expertise has meant that the exploitation of the system for management and operational reports has been slow, and there is currently no top line information for senior managers and Board members available from the system. The incomplete installation of the system in the branch network

and communication problems between banks has also held back improvements in customer service.

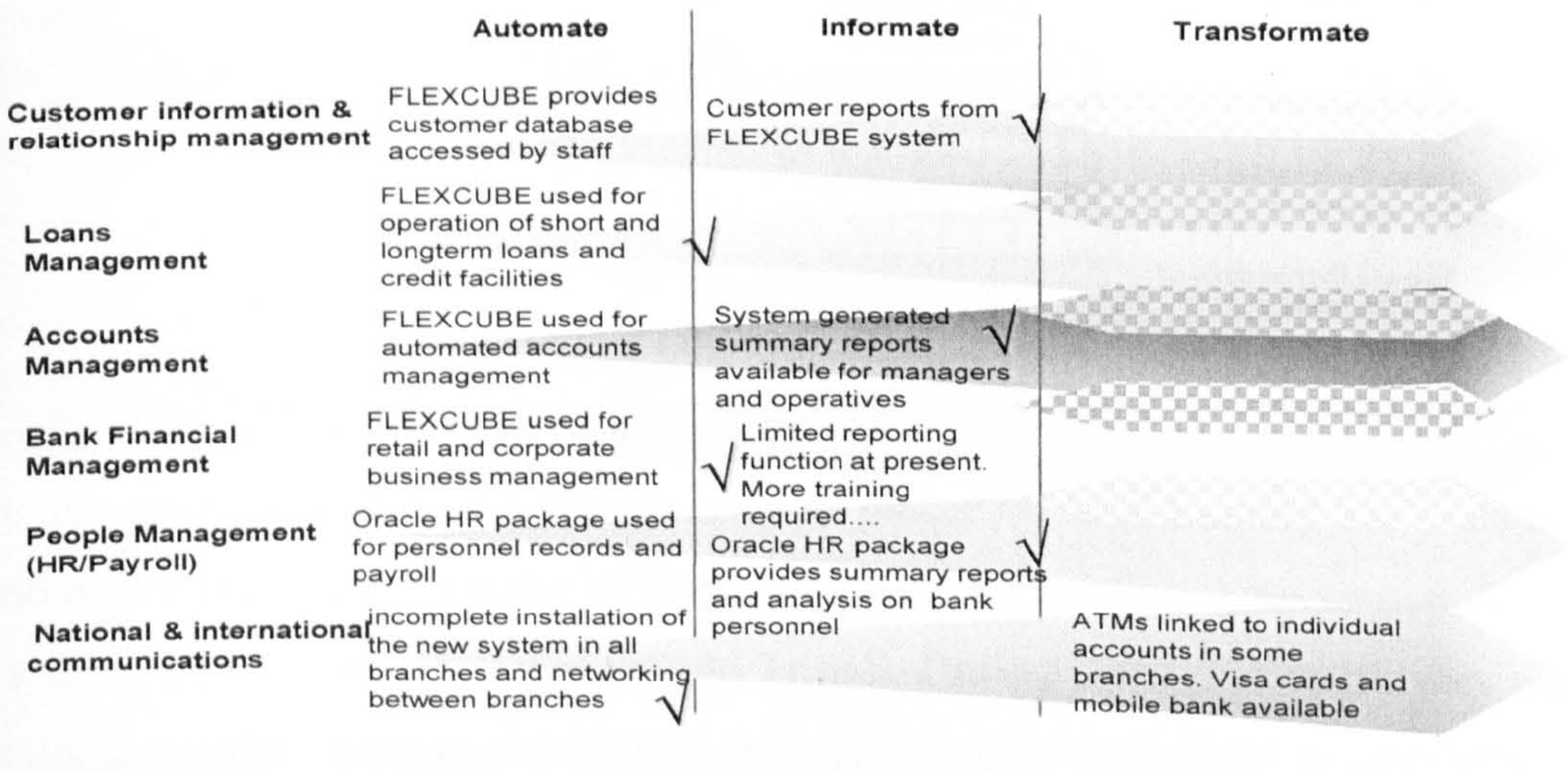


Figure 6-4 Wahda Bank 2010: Process Map – AIT assessment

The process chart for the AAB indicates the basic automation of some processes, but the provision of management and operational information lags behind the other two banks (Figure 6-5). This is partly because of the limitations of the Al Esteshary AIS and also partly because of the lack of appropriate training for staff.

These changes are illustrated by more detailed examples of process change below.

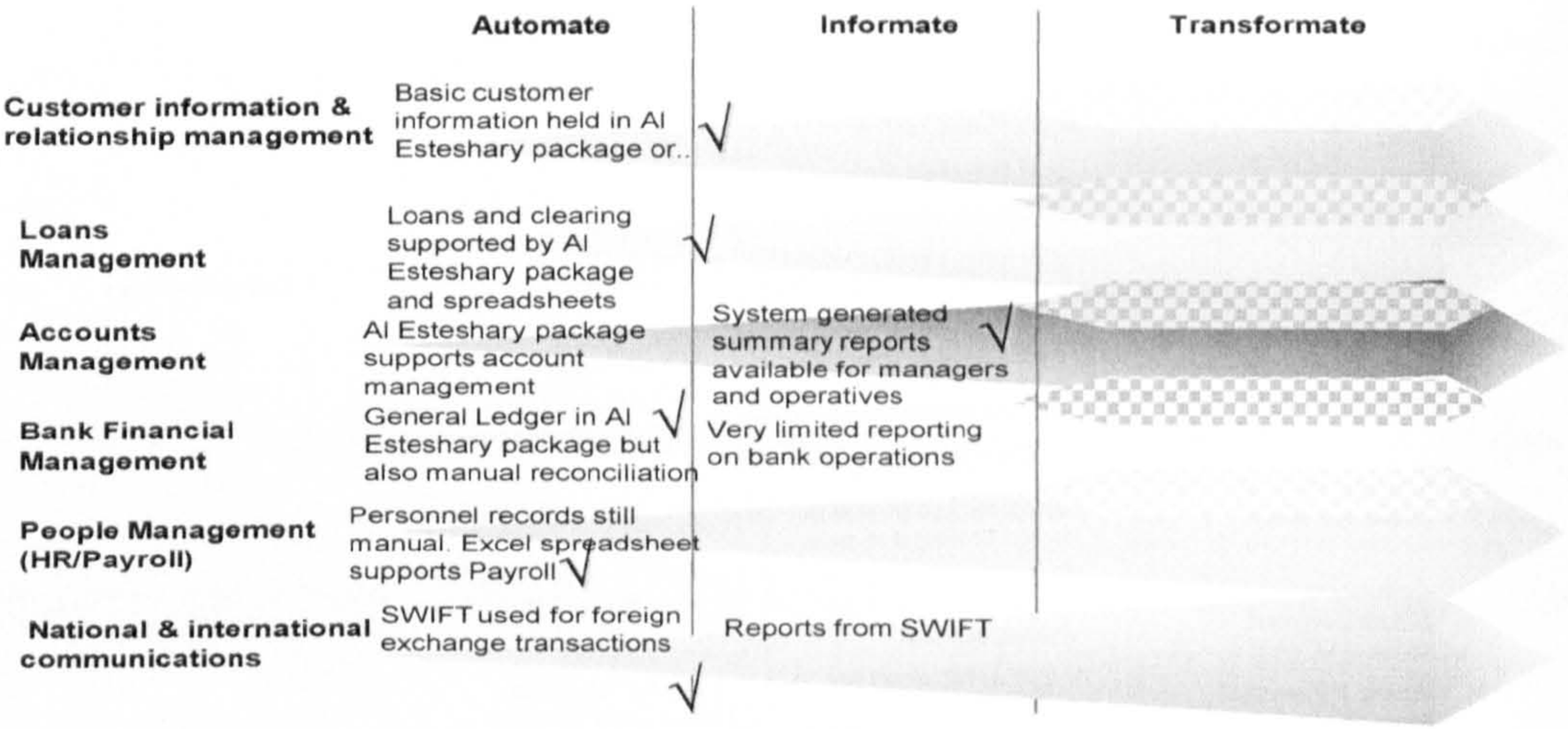


Figure 6-5 Alegmaa Alarabi Bank 2010: Process Map – AIT assessment

6.4 Training and Up-skilling of the Workforce to support Benefits delivery

The findings of this thesis, related to training and up-skilling of the workforce in Libyan banks and their importance in delivering the investment benefits, show that in Libyan banks, there is a lack of qualified, efficient and skilled staff because the available ISs need high skills and training in terms of operation and security for utilising the capabilities of the systems. Moreover, there are no clear policies or plans in place for training and up-skilling related to ISs. In the CDB there are internal training courses that are organised by the management of IT, and there are also courses undertaken by the VISA Company. In the WB there are many training programs, but they are random and ill-considered and there are training programmes with the central bank of Libya. In addition, all Wahda bank's employees have had computer courses. In the AAB, there are no training programmes in the bank regarding IT and the training is done during the operation process of the system. Table 6-4 shows the training programmes that were organised by the Central Bank of Libya, regarding the three banks through 2006, 2007 and 2008. The percentage of trainees was represented in 2008 and about 33% of WB employees' number,

3% of AAB employees' number, and 0% of the CDB employees' number. In 2007, 78 trainees from the WB had received training courses abroad.

Table 6-4 Trainees number who participated in CDBL training programmes

Banks / Programmes	Wahda Bank			Commerce and development bank			Alegmaa Alarabi Bank		
	2006	2007	2008	2006	2007	2008	2006	2007	2008
Seminars	34	42	88						
Specialised courses	100	295	483		2				9
Events	16	20	37						
Computer courses	17	65	99						
English courses	70	430	311	7	5				
Total	**237**	**852**	**1018**	**7**	**7**				**9**

Source: CBL annual reports of 2007 and 2008

On the other hand, in the CDB emphasis was placed on local training due to its lower cost, and benefiting a larger number of bank employees by holding these courses in the Bank's Training Centres in both Benghazi and Tripoli. During 2009, 306 employees participated in local courses, compared with 165 and 283 in 2007 and 2008 respectively, a rate of increase of 72% and 8% in 2008 and 2009 respectively. The following Table 6-5 indicates the local training courses and their subjects:

Table 6-5 Local training courses at the CDB (2007, 2008 and 2009)

Training Type	Number of trainees		
	2007	2008	2009
Banking	101	53	214
Computers	6	59	64
English	21	10	12
SWIFT	4	4	4
Electronic Payment systems	32	153	9
Seminars and conferences	1	4	3
Total	**165**	**283**	**306**
Employee total number	**677**	**693**	**787**

Source: CDB annual report 2008 and 2009

The percentage of trainees represented in 2009 was about 39% of the CDB employees' in 2009, compared with 24% and 41% in 2007 and 2008 respectively. Regarding training abroad, the bank participated in a number of courses, seminars and conferences abroad by 17 delegates, compared with 7 in 2007.

As a result, lack of training and up-skilling will be an obstacle in delivering the IT investment in Libyan banks. Libyan banks must allocate enough funds and make clear plans for training and up-skilling of the workforce. In the CDB and Wahda Bank, there was same strategy for training on the new systems which is training of trainers, where the employees have been trained by the trainers inside the bank, and the trainers were trained outside the bank by the companies that designed the systems (MISYS, FLEXCUBE).

The main results include the following:

- There is a lack of training and up-skilling in IT in terms of number and quality of training programmes; gaining advantage from training programmes is still inadequate, because there are no good nominations to the employees for the courses training and some employees not being qualified. In addition, due to there being no policies and plans for training and up-skilling of the workforce, the impacts of the training and up-skilling are not as significant as they could be.
- In most Libyan banks, there are no training programmes regarding ISs. Employees have been trained on the new systems during the operation of the system inside the bank and they have not had any training outside the bank. However, recently training management posts have been established in some Libyan banks. In addition, external training through advanced foreign banks in this area is required to improve employees' performance and banking business performance.
- A major challenge to the selected Libyan banks is the lack of human resources in terms of available staff in administrating and operating the developed accounting systems and effectively utilising the applications. Computerised-accounting system functions involve the application of specialised accountants obtaining knowledge and skills in using and developing computer systems (Cushing and Romney, 1987). The recruitment of accountants having this knowledge and skills is essential for the successful design,

implementation, maintenance and operation of developed accounting systems. Libyan banks are, in general, affected by the shortage of qualified local IT professionals.

- Most employees in Libyan banks are satisfied with the new systems because they save time and effort and improve performance through speed and accurate work accomplishment.

- In Libyan banks, the employees have a role in improving the AIS through submission of their suggestions to the management for study and implementing these suggestions if possible. Hence staff participation to develop and improve the system creates a kind of rivalry between staff thus positively reflecting on the banking performance.

- In most Libyan banks, the impact of training and up-skilling of the workforce on the delivery of the benefits of investing in IT is not significant for many reasons such as; training and up-skilling now is weak compared with the high level of available technology; no clear policies and plans for training; and a lack of qualified, efficient and skilled staff because it needs high skills and training in terms of operation and security for utilising the capabilities of the system optimum use. In addition, lack of a good training, a bad nomination for trainees have led to a lack of achieving the benefits of investing in IS in the banks. However, training and up-skilling the workforce has a positive impact on the delivery of the benefits of investing in IS in terms of accuracy of work, completion speed of transactions, and reducing errors.

- The most important benefits that have been reached from the training and up-skilling of the workforce in Libyan banks can be summarised as follows: improve customer services; raise the capacity to deal with the growth in number of transactions; reduce the number of errors and improve the accounting control in terms of accuracy and recording transactions.

6.5 Comparison of information system Strategy between the three case studies

The overall picture across the three banks is one of significant investment in new AIS, communications and related technologies in the past 5-7 years. The basic strategy adopted by all three banks has been to implement an integrated software package to support bank operations and provide management information, allied to the adoption of modern

technologies to aid inter-branch and international communications and enhance customer service. This strategy appears to be basically sound, but the following points are worth highlighting:

- The CDB has invested heavily in the MISYS system and the networked connection of Bank branches has enabled significant improvement in customer service and bank efficiencies. However, the software package should now be rolled out more extensively to encompass other process areas, notably customer information, loans management and in bank human resource management. Training and up skilling of staff also emerged as a key factor for future improved use of the system
- The WB has the most broadly implemented AIS, but its potential is hampered by lack of systems skills and inadequate communications with the branches. The basic package selection is likely to prove a sound strategic direction, supported as it is by the CBL as part of the National Payment System initiative. Bank management noted the need to move on to use data warehouse and data mining capabilities that the package offers to improve information availability and develop end-user capabilities. Training and up skilling will be required. Delays in data entry and lack of communications as a result of incomplete installation of the new system in all branches and incomplete network linkage between branches were highlighted in questionnaire responses.
- The AIS used by the AAB is not mainstream (in comparison with MISYS and FLEXCUBE) and is available with an Arabic interface only. A review of information strategy should carefully consider whether this software is a sound platform for current and future operations. Improved communications and branch network linkage will also be required to take better advantage of existing software and iron out data inconsistencies in the system. The bank does not currently provide ATMs, Visa cards, or mobile banking and the business case for introducing these technologies should be reviewed.

Chapter 7:
Conclusions and recommendations for further research

Chapter 7 : Conclusion and recommendation for further research

The aim of this chapter is to assess the purpose of this study and reinforce the contributions of this research, its limitations, and potential for future. According to the main findings of this thesis, the investment in AIS is very important to Libyan commercial banks as a result of the rapid development in the Libyan business environment and notably the opening of branches of foreign banks in Libya as well as a the significant developments in banking technology in the world.

The Libyan commercial banks must provide improved efforts toward establishing efficient AISs and improved levels of IT. These efforts should include the following requirements:

- Due to a lack of a communications in the country preventing the banks from doing business better, especially in ATMs, which is the most important problem that faces all Libyan banks, the government must support the development of IT investment in Libyan commercial banks through the improvement of communication infrastructure in the country.

- Provide local experts in IT inside the banks for development, support and maintenance of ISs for saving time and cost, and also provide skilled employees in IT; properly skilled staff will save time and effort, and can provide accurate and timely information. In addition, they deal with the largest number of transactions compared with other employees.

- Review and introduce improvements to the AISs in some Libyan commercial banks, for example the systems should involve personal information about customers to make decisions more accurately, especially regarding decisions of credit.

- Replace the existing systems and adopt modern systems of banking business in some Libyan banks to keep pace with developments in the Libyan business environment as well as to strengthen their competitiveness among other banks that have well developed systems.

- Provide suitable training to prepare staff for operating advanced systems by developing curricula and methods of training materials in Libyan banks, where the lack of efficient, qualified and skilled staff is one of the main problems that face all Libyan banks.

- Libyan banks should invest in their personnel by undertaking intensive training courses in computing, networking, maintenance, database management and end user computing. Without skilled staff, hardware and software remains ineffective.

- Organise external training with advanced foreign banks in the banking business for employees. This is required to improve their performance and the overall banking business performance, and to keep pace with the development in IT regarding banking.

- Improve public awareness of the role of the IT in the banking business through improving the marketing of new services and definition of the benefits of the use of technology to the customers in terms of saving their time and effort through the accessibility of the service.

- The dissemination of a culture of investment in IT in the Libyan business environment because the use of technology has become a vital requirement to increase the efficiency and effectiveness of AISs. It is important that banks take more interest in IT awareness and allocate sufficient budget for its employees to attend training; if one or two employees are trained they can train and share their knowledge among other employees to increase awareness in IT in Libyan banks.

- Set up an appropriate number of specific plans and speed up the establishment of departments and training centres in banks for the training of new employees and up-skilling of the existing staff on IT to improve business performance, and to achieve the benefits of AIS investment adequately and satisfactorily.

- Appropriate nomination for qualified trainees in accordance with the functional and business needs to benefit from training courses according to the training plan and to achieve the benefits of investing in IS in the banks.

- There is a need to upgrade the means of communication between Libyan banks and their branches through the complement of networking linkage in order to facilitate the process of conveying information to managers and facilitate providing services to the customers, thus improve banking performance.

- There is a need to improve the communication infrastructure in Libya to facilitate and help Libyan banks to establishing and complement the networking linkage between banks and provide more advanced services that depend on communication technology.

7.1 Conclusion about Research Questions

As set out in chapter 1, three overarching themes were to be explored. This part presents the conclusions reached about the three questions. That is, the findings in chapter 5 are compared with the related literature reviewed in chapter 2. Each research question will be discussed in the subsequent sections.

Research Question 1: What is the extent and nature of AIS investment in Libyan commercial banks?

In Libyan commercial banks, IT investment is still in its infancy compared with most developed countries. However, in the last few years there has been, and still is, a significant concern by Libyan banks to invest in IT. This has been especially after opening the doors to foreign banks to invest in Libyan banks and open their branches in Libya as well as some private Libyan banks adopting advanced systems in banking business. Thus the competition has arisen among the banks to achieve a bigger share in the Libyan banking business through providing the latest and easier to use services towards the customers by using developed IT. In the context of the Central Bank of Libya (CBL) these is a trend towards increasing the benefits of the large developments of information technologies and improving the banking activity environment. The Central Bank of Libya and five of the largest public commercial banks in Libya jointly started implementing an ambitious program for technological developments in the area of information technology in the National Payment System. This program was preceded by approving a plan, set by a committee of experts in the banking activities. This plan's objective is to formulate a strategy that ensures efficiency, effectiveness and safety for the developments of a

national payment system to contribute to the development of financial and other economic sectors. (See Chapter 2 for more details).

Research Question 2: Has investment in AIS resulted in significant change in business processes? If so, what role has this played in improving business performance in Libyan commercial banks?

Based on the results of the interviews and banks' documents (see: chapter 5), and the analysis contained in Chapter 6, investment in AIS has resulted in some change, development and improvement in business processes, especially in banks that invested in IT. These include some business processes and new services such as Human Resource Management (HR), Visa Card, Mobile Bank, Automated Teller Machines (ATM), Points of Sales (POS), Bills and Collections, Electronic Money Transfer, Automated Clearing House (ACH) and Automated Checks Processing (ACP). These have led to improved business performance in Libyan commercial banks in the following regards: accurate information is available on time and easily to all internal and external users; saving time and effort; speed of providing information to the management for decision-making easily and accurately; ensuring the quality of the data; accommodating any new activities; creating new services and improving extant services; increasing bank customer numbers and income; increasing speed of completion of the transactions; cutting service prices and lowering services cost; helping banks to achieve their goals; and obtaining a good reputation and strengthening banks' competitiveness among other banks.

However, such advances are by no means the norm, and real process improvement has been patchy and not uniformly evident across the banks studied. Furhermore, there remain obstacles that keep the banks from further improvement in business performance, which are the following: lack of staff's efficiency; lack of culture of customers to use technological services because there is no good services marketing; lack of training and up-skilling of the employees; and incomplete linkage network between some banks branches.

Research Question 3: How important is training and up-skilling of the workforce in making sure the benefits of investment are delivered?

The answer to this question is primarily based on the results of interview analysis (see: chapter 5). In Libyan commercial banks, the training and up-skilling of the workforce is very important and essential to realise the benefits of AIS adequately and satisfactorily

through achieving the following; improving customer services; raising the capacity to deal with the growth in number of transactions; reducing a number of errors; Improving the accounting control in terms of accuracy and recording transactions; and utilising capabilities and capacities of the developed information systems to the maximum.

However, in most Libyan banks, the impact of training and up-skilling of the workforce on the delivery of the benefits of investing in information technology is not significant for many reasons such as; training and up-skilling now is weak compared with the high level of available technology; there are no clear policies and plans for training; and a lack of qualified, efficient and skilled staff because the available information systems need high skills and training in terms of operation and security for utilising the capabilities of the systems.

7.2 Original Contribution to Knowledge

This thesis provides several contributions to the knowledge of AIS investment and business performance in the commercial Libyan banks. The following are the main contributions made by this study:

- Although the focus of the current study has perhaps been the subject of previous studies in other countries, the findings of the present study are of particular importance since, to the best of the researcher's knowledge, no previous study has been conducted on the impact of investment in AISs on business performance in the Libyan commercial banks.
- The study provided comparative information as a reference about Libyan commercial banks and provided also important benefits achieved by IT investment in Libyan commercial banks and evidence of the extent to which IT investment is needed in Libyan commercial banks.
- The present study presented an analysis of the extent and nature of AIS investment and business performance in Libyan commercial banks and presented also an analysis of the level of training programmes and policies in Libyan commercial banks.
- The findings of this study may prove useful for the Central Bank of Libya as well as Libyan commercial banks' managers, in order to increase efficiency of use IT in the

Libyan banking sector, and provide a clear perspective of the problems that affect the efficient use of developed ISs.

- AIS investment in Libya has not been studied qualitatively before. This study is therefore unique in giving participants an opportunity to state their opinions about the importance of IT use in Libyan commercial banks, and to identify some of the problems that arise during use of developed systems.

- The study presented the role of investment in AIS in improving business performance in Libyan commercial banks, and the importance of training and up-skilling of the workforce in making sure the benefits of investment are delivered.

- This study makes a contribution to training policies formulation and IT investment decisions. It could also be used as a reference source for Libyan banks.

- The research has shown that models formulated for application in the developed world can usefully be used and adapted to assess information systems in a developing world commercial context.

- The study contributed to the existing limited studies on AIS investment conducted on Libyan commercial banks. It clearly showed that there has been significant investment in modern AIS, that these systems have been implemented reasonably effectively, but that there is significant scope for harnessing their potential to improve business processes and bottom-line benefits; and that investment in training and up-skilling of the workforce is a key element in achieving this.

7.3 Limitations and Further Research

The opportunity to further explore and study AIS investment in Libyan commercial banks remains. However, it is not an easy task since a lot of information regarding investment is limited within this region. This study was limited to the Libyan commercial banks, and has focused on the investment in IS in the commercial banks in Libya. The business performance was tested only in the banking sector, and this sector was selected as the site for the case. Empirically, the study focused only on three Libyan case studies in the banking sector. Access, time and cost constraints and the amount of work involved

prevented the researcher from expanding the research setting. The targeted population includes pertinent bank personnel in three major Libyan commercial banks, which are Commerce and Development Bank, Wahda Bank and Alejmaa Alarabi Bank. This study was done while the adoption of advanced systems is still in its infancy in Libyan commercial banks and there is still incomplete linkage network between most of Libyan banks and their branches. It might be that different results would be given if this study were repeated after completion of linkage networks and Libyan commercial banks utilising the full capacities of their advanced systems or by adopting different research methods to see the effects on the business performance of the Libyan commercial banks. It is recommended that future research work be implemented to test the generalisation potential in other market sectors. Despite the fact that it is recognised that this study has some limitations, it is believed that the findings of this study provide a useful insight into the business processes and IT investment in Libyan banks and provide a starting point for future research.

As regards the banks themselves, it is clear that AIS have come to play a major role, enabling them to make progress in the provision of services and products sometimes through the redesign of business processes. Many organisations rely on information systems for decision-making, to improve customer service and develop appropriate reporting, monitoring and control mechanisms. To most effectively achieve this, it is generally accepted that IT/IS strategy must be closely aligned to business strategy. It has been suggested that 'strategic alignment of IT exists when a business organisation's goals, activities and processes are in harmony with the information systems that support them' (Bleistein et al, 2006). In the case of the three Libyan commercial banks studied here, there is evidence to suggest a reasonable alignment between IT/IS and organisational strategy. What appears to be missing is the development and embedding of operational and management skills to fully exploit the systems that have been acquired to effect a broader organisational change and progression. We must hope that these banks will have the political and economic contexts in which they can build on the undoubted progress made in recent years in the exploitation of AIS and related technologies.

APPENDIXES

Appendix N0.1: The Interview Permission

Dear Sir or Madam

I am conducting research, at University of Gloucestershire (UK). The title of my thesis is "Impact of investment in AIS (AIS) on business performance: The case of Libyan commercial banks".

This Semi-structured interview is part of my research. At this initial stage I am concerned with collecting data from all Libyan commercial banks. The purpose of this semi-structured interview is as follows:

1) To discover the extent and nature of AISs.
2) To identify potential case studies for further research and degree of access available.

I will be very grateful if you would participant in this semi-structured interview. It will take 40-45 minutes to complete.

Your response will be kept strictly confidential and used only for research purposes.

Finally, I would like to thank you for spending your time in answering the questions in this interview and for your comments and your suggestions, which will be useful.

Yours faithfully

Omar Sharkasi

Ph.D. student at University of Gloucestershire (UK)

Appendix No 2: Questionnaire Questions

Bank name **Interviewee's name** **Date**

Start time of the interview **Finish time of the interview**

Section 1: general information

1. **Your background**

1) **Education**
   - Below university degree
   - University degree
   - Higher university degree

2) **Awarding Body**

3) **Your position**
   - General manager
   - Executive manager
   - Division manager/staff
   - Staff

4) **Your department**
   - Finance, Accounting
   - Information systems/IT
   - Senior Executive
   - Other

5) **How long have you in this function?**
   - Under 5 years
   - 5 – 10years
   - 11 – 20years
   - over 20years

6) **Working experience**
   - Under 5 years
   - 5 – 10years
   - 11 – 20years
   - over 20years

7) **Your experience with accounting information systems**
   - Under 5 years
   - 5 – 10years
   - 11 – 20years
   - Over 20years

8) **Your main role relative to accounting information. Do you primarily:**
   - Collect accounting information
   - Manage those who collect accounting information
   - Use accounting information in tasks
   - Work as an information systems professionals
   - Manage information systems professionals

2. Your bank

1) **Ownership of bank**
   - State-owed banks
   - Private banks

2) **Date of establishment of the bank**

3) **Annual revenue dinars**
   - More than 100 million dinar
   - 50 million - 100 million dinar
   - 10 million – up to 50 million
   - Up to 10 million dinar

4) **Bank total assets**
   - More than 100 million dinar
   - 50 million - 100 million dinar
   - 10 million – up to 50 million
   - Up to 10 million dinar

5) **Bank total employees**
   - More than 1000
   - 500 – 1000
   - 100 – up to 500
   - Up to 100

6) **How many of the staff working in your department?**
   - Over 20 staff
   - 10 to 20 staff
   - 6 to 10 staff
   - Less than 5 staff

Section 2: Accounting information systems (AIS)

Please tell me about your bank's accounting information system (AIS)

1) **What kind of systems are you using for AIS?**
   - Manual
   - Computerised/Automated
   - Mixed

2) **How old is the AIS?**
   - The age
   - Maturity of the system

3) **What software is used for your AIS?**
   - Packaged software (please specify)
   - Bespoke/in-house developed
   - Personal Computer Spreadsheets or databases

4) **What is the basic information technology used to run the AIS?**
   - Mainframe computer with terminals
   - Mini-computers linked by a local area network
   - Stand alone personal computers
   - Wide area network linking different sites
   - ATMs for cash dispense
   - Electronic Funds Transfer infrastructure
   - Other technology (please specify)

5) **What business functions or processes do the accounting information systems undertake?**
   - Providing information
     a) Presented in the form of paper reports
     b) Displayed on a computer screen
   - Customer database/customer management
   - Ledgers (general ledger and subsidiary ledger)
   - Electronic Funds Transfer
   - P&L reporting
   - Financial statements
   - Managerial reports
     a) budgets
     b) performance reports
   - Updating of the data stored
     a) Real time?
     b) Batch transfer (e.g. overnight)?
   - Internal control considerations
     a) Adequate documentation

        It is the key to accountability. Documentation allows management to verify that assigned responsibilities were completed correctly.
        I) Designed adequate documents and records
        II) Adequately written description of task procedures

     b) Segregation of duties

        To prevent one person from having total control over all aspects of business transactions, specifically the following functions should be performed by different people.
        I) Authorizing transactions
        II) Recording transactions
        III) Maintaining custody of assets

6) **Is data quality issue a top priority in your AIS?**
   - Yes
   - No

7) **What kind of training do you have in AIS?**
   - Initial training to new employees
   - Regular training

8) **In last five years has there been additional investment in AIS in computers, software, training and upskilling? If so, what proportion of this is for hardware, software and training?**
   - Hardware
   - Software
   - Training
   - Upskilling

9) **What is your overall satisfaction with your bank's accounting information system?**
   Please use the following scale for this question
   - Completely unsatisfied
   - Fairly unsatisfied
   - Neutral
   - Satisfied
   - Very satisfied

10) **Please assess the standard of each of the following components in the operation of the accounting information systems in your bank (from 1 very low to 5 = Very High)**

(Please circle one number of each source)

	Very Low ⟵				⟶ **Very High**
• People	1	2	3	4	5
• Procedures	1	2	3	4	5
• Data	1	2	3	4	5
• Software	1	2	3	4	5
• Hardware	1	2	3	4	5

11) **Is there an executive – level (steering committee) to plan and oversee the information system function?**
   - Yes
   - No

12) If so, does this committee consist of high – level management people? Please specify.

13) Is there long-term planning to develop accounting information systems?

- Yes
- No

14) If so, which of these questions are taken into account when drawing up the plan?

- What the system will consist of, for example what new functionality is required?
- How it will be developed, and by whom?
- How the needed resources will be acquired?

15) Are there any comments or further information regarding accounting information systems in your bank that you wish to add?

Appendix No 3: Interview questions

General questions:

- The respondent's name and position?
- How long is his/her experience (in this position)?
- Highest level of education and qualifications that may be in place (for this level)?

I. About the extent and nature of AIS investment (RESEARCH QUESTION 1):

The Semi-structured interview questions:

1- Could you describe the nature and attributes of the accounting information systems in your bank?
This question will involve more enquires such as: - a) since when have you had AIS? b) Who designed the system? c) Has your bank recently implemented or plan to implement advanced technology? d) What is the extent of computerisation of accounting system in your bank?

2- How would you characterise your bank's use of Information technology?
These characteristics involve, for example: - you compete at the cutting edge of innovation and use information technology as a competitive weapon, you view information technology as a critical and essential investment area and you stay current on technology, without getting too far ahead of our competition.

3- What are the types of the information generated by the accounting system in your bank?
Such as: - Financial statements for external users, Managerial reports for internal users, operational reports on business transactions for operatives/controllers and top line information (EIS/Business Intelligence) for Board members?

4- Could you let me know about the most important problems and obstacles that arise during the operation of accounting information system and how do you cope with?
For instance: - kinds of these problems, availability and quality of information, maintenance and support the system, the reasons of these problem, when were the problems raised? Are they related to your bank or all Libyan banks, Have they any relation with human or technical factors?

5- Do you think the system is easy to use/ simple? Why? Why not?

6- In your bank, what are the main areas of business which IT projects have covered?

The Checklist Questions:

I- Who are the users of the information generated by the accounting information system in your bank? Please rank the affirmative answers in order of frequency of use. (1 being the most frequent user...etc)

Users	Yes	No	Rank
Shareholders			
Partners			
Governmental bodies			
Tax department in the finance ministry			
Managers in your bank			
Investors and creditors			
Operatives, controllers, office staff			
Bank top executives/Board members			

II- About the investment in AIS, business processes and business performance (RQ2):

The Semi-structured interview questions:

1- How would you assess the effectiveness and the efficiency of the accounting information system in your bank? There are some points that might be useful to discuss during the discussion.

- The important factors that may influence the efficiency in the deployment of AIS.
- The obstacles that keep you from being more effective AIS.
- Evaluate cost /benefit of accounting information system.
- Ensuring the quality of the AIS.
- the availability of information to all users (internal/ external)

2- How does investment in information technology influence on the bank's reputation?

3- In your opinion, to what extent are the current accounting systems effective in supporting managers in decision-making and problem solving? Please give examples as appropriate.

For more discussion, if his/her answer is No, so what do you recommend for the current accounting system to meet management requirements and accounting technology availability? Has the bank's management changed (or plans to change) its accounting information system to support decision-making? What are these changes and how are they implemented?

4- In your opinion, to what extent is there a need to develop the accounting information system in response to the development and changes in the Libyan business environment? (e.g. NPS)

5- What role has information technology played in response to the competition that your bank has faced?

6- In your opinion, how does the accounting information system in your bank develop business performance?

For further discussions, interviews will be asked concerning his opinion; is the level of accounting information system in his bank is sufficient to improve business performance? If it is not enough, how can it be improved?

7- What is the effect of the upgrade in IS /IT infrastructure on structure of the workforce and activities in your bank?

8- How has the upgrade of IS/IT infrastructure impacted on banking transaction costs and the number of staff / branches? Please explain.

The Checklist Questions:

1- From the list below, what are the factors driving investments in Information Technology in your bank? Please rank the affirmative factors in order of importance. (1 most important…etc).

Factors	Yes	No	Rank
Create overall market growth (create new demands)			
Market share growth (take from competition)			
Defend current market share position			
Improve and increase customer services			
Cut service prices/lower service costs			
Increase internal efficiency			
Increase understanding of customer needs			
Increase efficiency of business transactions			

2- Which of the following factors contribute to the success of your information technology bank? Please rank the contributors in order of importance. (1 most contributory...etc)

Contributors	Yes	No	Rank
Technical skills of information system staff members			
Alignment of information system and business strategies			
Customer service attitude towards information systems			
Supportive bank management/users			
Partnering with external service provider(s)			
Adequate funding			
Reduce cost and errors			
Provide quality and innovation services to the customer			

3- Please respond to the statements below using Yes or No and rank affirmative answers in order of importance. (1 more important...etc)

Statements	Yes	No	Rank
Information technology enables your bank to increase revenues			
Information technology provides a way for your bank to reduce costs			
Information technology gives your bank competitive advantage			
Information technology assists and supports the needs of your bank's business			
Information technology is an important component and is aligned to your business strategy			
Information technology plays an integral role in meeting customer requirements			

4- Does your bank make the following items available to implement, support and develop accounting information systems? Please rank the affirmative items in terms of their availability. (1 more available...etc).

Items	Yes	No	Rank
Enough funds for on-going investment in AIS			
Technical tools to develop and support AIS			
Outside specialist experts when required			
Skilled personal to implement and support the AIS			

5- Do you agree that the following benefits of the information technology banking services are evidenced by your bank? Pleas rank the evidenced benefits in terms of your agreement. (1 more important…etc).

Benefits	Yes	No	Rank
It is easy to use IT banking services			
IT banking services save your time			
IT banking services make your banking more convenient			
IT banking services provide privacy in your banking transaction			
IT banking services provide accurate accounting information			

III- About the importance of training and up-skilling of the workforce (RQ3)

1- In general, could you assess the training and up-skilling of the workforce programmes and policies related to AIS in your bank?
This question will include some additional questions (e.g. were the employees trained to use a new system? Who trained them? Are the employees satisfied with new system?)

2- What is the role that employees play in improving the AIS?
(e.g. suggest changes within new system after implementation)

3- To what extent do you think the training and up-skilling of the workforce is needed to realise the benefits of AIS adequately/satisfactorily?

4- In general, to what extent do you think employees' skills in IT can help to improve business performance? Please give example.

5- In your opinion what are the effects of training and up-skilling of the workforce on the benefits delivery of investment in your bank?

The Checklist Questions:

1. Has the training and up-skilling of the workforce led to the following benefits? Please rank the benefits in terms of importance. (1 more important...etc)

Benefits	Yes	No	Rank
Improve customer services			
Raise the capacity to deal with the growth in number of transactions			
Improve working conditions and competition			
Improve the accounting control in terms of accuracy and recording transactions			
Reduce the number of employees			
Reduce a number of errors			
Improve competitive advantage of the Bank			

Appendix No 4: Summary of respondents' answer (case study 1)

Case 1: Commerce and Development Bank

I. The extent and nature of AIS investment

Q1. Could you describe the nature and attributes of the accounting information systems in your bank?

Age of Current AIS	1 to 5 years	5 to 10 years	Over 10 years
		5	
Designer of the system	Local designer	Foreign designer	Mixed
		4	1
Implemented technology	Advanced	Average	Elementary
	5		
Computerisation of AIS	Computerised	Mixed	Manual
	5		

Q2. How would you characterise your bank's use of Information technology?

Statement	Yes	No
Competition at the cutting edge of innovation	**5**	
Use IT as a competitive weapon	**5**	
View IT as a critical and essential investment	**5**	

Q3. What are the types of the information generated by the accounting system in your bank?

Types of information	Yes	No
Financial statement for external users	5	
Managerial reports for internal users	5	
Operational reports on business transactions	5	
statistical reports	5	
Top line information (EIS)	5	
Information for board members (DSS)	5	

Q4. Could you let me know about the most important problems and obstacles that arise during the operation of accounting information system and how do you cope with?

Problems and Obstacles	CDB1	CDB2	CDB3	CDB4	CDB5
Kinds of these problems and obstacles	Lack of qualified staff and lack of communications	Educational level of the staff and lack of communications	Lack of Qualified and skilled staff	lack of training on the system	a lack of communications and operation, maintenance and support of the system
Maintenance and support the system	Hiring experts from outside the bank				some problems in operation, maintenance and support the system
Reasons of theses problems	No specialists in technology staff and lack of communications infrastructure in the state	lack of qualified staff and training and lack of communications infrastructure in the state	Lack of efficient staff	There is no branch of the company that designed the system in Libya	Lack of training and up-skilling and communications infrastructure in the country
Their relation with the bank or all Libyan bank	All Libyan banks	All Libyan banks	All Libyan banks	All Libyan banks	All Libyan banks
Their relation with human or technical factors	Human Element and technical factors	Human Element and technical factors	Human element	Human element	Human Element and technical factors

Q5. Do you think the system is easy to use/ simple? Way?

Respondents	Yes	No	Way?
CDB1	√		It is easy and simply available to all and just needs a bit of training
CDB2	√		all banking operations are available in the system and it just needs a qualified person
CDB3	√		It just needs training to follow the correct procedures
CDB4		√	Very advanced and needs time and training
CDB5		√	It is difficult in terms of support and maintenance as a result the evolution of the system and requires highly qualified and skilled staff.

Q6. In your bank, what are the main areas of business which IT projects have covered?

Respondents	The main areas of business
CDB1	All main areas of business in the bank have been covered by information technology projects
CDB2	All main areas of banking business have been covered by information technology projects
CDB3	All main areas of banking business have been covered by information technology projects.
CDB4	All banking business activities have been covered by information technology projects
CDB5	All banking business activities have been covered by information technology projects

Q7. Who are the users of the information generated by the accounting information system in your bank? Please rank the affirmative answers in order of frequency of use. (1 being the most frequent user...etc)

Users	Yes	No	Frequency of the rank							Rank in total	
			1	2	3	4	5	6	7	*Average	Rank
Bank top executives/Board members	5		4		1					1.40	1
Managers in your bank	5			4			1			2.60	2
Operatives, controllers, office staff	5				3	1		1		3.80	3
Shareholders	4	1			1	2		1		4.25	4
Tax department in the finance ministry	5		1				2	1	1	4.80	5
Investors and creditors	5					2	2		1	5.00	6
Governmental bodies	4	1		1				1	2	5.50	7

*to rank the users, the frequency of the rank was given weight as following: Σ FR x R / RN, where FR= Frequency of the rank, R= Rank and RN= number of Respondents.

II. The investment in AIS, business processes and business performance.

Q1. How would you assess the effectiveness and the efficiency of the accounting information system in your bank?

Statement	CDB1	CDB2	CDB3	CDB4	CDB5
The important factors that may influence the efficiency in the deployment of AIS	accurate information is available on time to all internal and external users	Saving time and effort	Ensuring the quality of the data	providing required information in time and saving time and effort	Ensuring the quality of data , it accommodates any new activities and providing information easily to all users
The obstacles that keep you from being more effective AIS	Human element	Lack of staff's efficiency	there are no any obstacles		lack of culture of customers to use technological services and a lack of training and up-skilling
Evaluate cost /benefit of accounting information system	The AIS's benefits outweigh its cost	There is substantial saving by the use of IT	Benefits from the system are greater than its cost	The cost is high but there are great benefits obtained	
the availability of information to all users (internal/ external)	Available on time to all internal and external users	Required information is available on time to internal and external users	Providing information to internal users constantly and to external users monthly and quarterly	Providing information to all users.	

Q2. How does investment in information technology influence on the bank's reputation?

Respondents	Influences
CDB1	Customer numbers have increased and increased income and a good reputation for the bank
CDB2	the bank's reputation have been increased, which increases interest of customers to deal with the bank
CDB3	a positive influence on the bank's reputation and strengthen its competitiveness among other banks
CDB4	A positive impact on the bank's reputation, creation new services and increases number of customers and income
CDB5	It has led to an increase reputation of the bank

Q3. In your opinion, to what extent are the current accounting systems effective in supporting managers in decision-making and problem solving?

Respondents	Effectiveness
CDB1	The system is very effective in supporting managers for decision-making
CDB2	The system is very useful in supporting managers to make decisions and solve problems
CDB3	The system is effective to the maximum extent in support of decision making
CDB4	The system is effective, where it make decision-making faster and more accurate
CDB5	The system is very effective in supporting managers

Q4. In your opinion, to what extent is there a need to develop the accounting information system in response to the development and changes in the Libyan business environment? (e.g. NPS)

Respondents	Need to develop
CDB1	There is no need, the Bank is advanced in its use of information technology
CDB2	The bank is connected with the some elements of the NPS
CDB3	The system is compatible with the changes and developments in the Libyan business environment
CDB4	The bank is ready to deal with the NPS project
CDB5	the bank ready now; just we are waiting other banks to connect with them through NPS

Q5. What role has information technology played in response to the competition that your bank has faced?

Respondents	Role of information technology
CDB1	An essential part to play in the competition which the bank has faced with the largest banks in terms of capital and age
CDB2	A great role to play in the competition. These led us to obtain new customers to the bank and to maintain existent customers
CDB3	A major role. The current bank's reputation was caused by using advanced information technology
CDB4	The bank relies on information technology as a strategy in competition with other banks
CDB5	A key role in the competition, the most services are similar in all Libyan banks, but information technology makes a difference in a way of providing these services

Q6. In your opinion, how does the accounting information system in your bank develop business performance?

Respondents	Role of information technology	
	Level of IT is sufficient to improve business performance	**If it is not sufficient, how can it be improved?**
CDB1	Through providing the accurate and timely information and improving the speed and accuracy of transactions	By training and up skilling the workforce
CDB2	Through providing accurate and timely information. the level of AIS is sufficient	
CDB3	The level of AIS is sufficient. It has Simplified transaction, reduced costs and time and supported decision-making	
CDB4	The system is good and sufficient because it results in speed of services delivery and providing of information on time as well as reducing of procedures	
CDB5	The system is sufficient by providing new services and improving existing services	

Q7. What is the effect of the upgrade in IS /IT infrastructure on structure of the workforce and activities in your bank?

Respondents	Effects
CDB1	Providing new services, improving existing services and the accomplishment of transactions and increasing income and customers
CDB2	Providing a new services, improving existing services and made the accomplishment of transactions more accurate and speed
CDB3	Improving employees performance and banking business performance and providing new services to the customers
CDB4	Reducing a number and cost of transactions and creating new banking activities
CDB5	Provided new services, increasing accuracy of information, reducing time to complete transactions and errors, improving services and creating new activities

Q8. How has the upgrade of IS/IT infrastructure impacted on banking transaction costs and the number of staff / branches?

Respondents	Impacts		
	On the banking transaction costs	**On the number of staff**	**On the number of branches**
CDB1	Decrease	Decrease	No impact
CDB2	Decrease	Decrease	No impact
CDB3	Decrease	Decrease	No impact
CDB4	Decrease	Decrease	Increase
CDB5	Decrease	Decrease	No impact

Q9. What are the factors driving investments in Information Technology in your bank? Please rank the affirmative factors in order of importance. (1 most important etc).

Factors	Yes	No	Frequency of the rank								Rank in total	
			1	2	3	4	5	6	7	8	*Average	Rank
Improve and increase customer services	5		4		1						1.4	1
Increase internal efficiency	4	1		1	1	1	1				3.5	2
Cut service prices/lower service costs	5			2		1	1	1			3.8	3
Increase understanding of customer needs	4	1		1	1			2			4.25	4
Market share growth (take from competition)	5			1	1		1		2		4.8	5
Create overall market growth (create new demands)	5		1			1	1			2	5.2	6
Increase efficiency of business transactions	5				1	1		1	1	1	5.6	7
Defend current market share position	4	1				1		1	1	1	6.25	8

*to rank the users, the frequency of the rank was given weight as following: Σ FR x R / RN, where FR= Frequency of the rank, R= Rank and RN= number of Respondents.

Q10. Which of the following factors contribute to the success of your information technology bank? Please rank the contributors in order of importance. (1 most contributory...etc)

Contributors	Yes	No	Frequency of the rank								Rank in total	
			1	2	3	4	5	6	7	8	*Average	Rank
Technical skills of information system staff members	5		3		1		1				2.2	1
Alignment of information system and business strategies	5			1	1		1		1	1	5.0	6
Customer service attitude towards information systems	4	1				1		1	1	1	6.25	8
Supportive bank management/users	5			2	1	1		1			3.4	2
Partnering with external service provider(s)	4	1			1		1	1		1	5.5	7
Adequate funding	5				1	3			1		4.4	5
Reduce cost and errors	4	1	1	1			1			1	4.0	3
Provide quality and innovation services to the customer	4	1	1	1				1	1		4.0	3

*to rank the users, the frequency of the rank was given weight as following: Σ FR x R / RN, where FR= Frequency of the rank, R= Rank and RN= number of Respondents.

Q11. Please respond to the statements below using Yes or No and rank affirmative answers in order of importance. (1 more important...etc)

Statements	Yes	No	Frequency of the rank						Rank in total	
			1	2	3	4	5	6	*Average	Rank
Information technology gives your bank competitive advantage	5		3		2				1.8	1
Information technology enables your bank to increase revenues	5		2	1	1	1			2.2	2
Information technology provides a way for your bank to reduce costs	5			3	1		1		2.8	3
Information technology assists and supports the needs of your bank's business	5			1		2	1	1	4.2	4
Information technology is an important component and is aligned to your business strategy	5				1		3	1	4.8	5
Information technology plays an integral role in meeting customer requirements	5					2		3	5.2	6

*to rank the users, the frequency of the rank was given weight as following: Σ FR x R / RN, where FR= Frequency of the rank, R= Rank and RN= number of Respondents.

Q12. Does your bank make the following items available to implement, support and develop accounting information systems? Please rank the affirmative items in terms of their availability. (1 more available...etc).

Items	Yes	No	Frequency of the rank				Rank in total	
			1	2	3	4	*Average	Rank
Enough funds for on-going investment in AIS	5		5				1	1
Technical tools to develop and support AIS	5			5			2	2
Outside specialist experts when required	5				5		3	3
Skilled personal to implement and support the AIS	5					5	4	4

*to rank the users, the frequency of the rank was given weight as following: Σ FR x R / RN, where FR= Frequency of the rank, R= Rank and RN= number of Respondents.

Q13. Do you agree that the following benefits of the information technology banking services are evidenced by your bank? Pleas rank the evidenced benefits in terms of your agreement. (1 more important...etc).

Benefits	Yes	No	Frequency of the rank					Rank in total	
			1	2	3	4	5	*Average	Rank
IT banking services save your time	5		2	2	1			1.8	1
IT banking services provide accurate accounting information	5		1	2	2			2.2	2
IT banking services make your banking more convenient	5		1		1	2	1	3.4	3
IT banking services provide privacy in your banking transaction	5			1	1	2	1	3.6	4
It is easy to use IT banking services	5		1			1	4	5	5

*to rank the users, the frequency of the rank was given weight as following: Σ FR x R / RN, where FR= Frequency of the rank, R= Rank and RN= number of Respondents.

III. The importance of training and up-skilling of the workforce

Q1. In general, could you assess the training and up-skilling of the workforce programmes and policies related to AIS in your bank?

Respondents	Were the employees trained?	Who trained them?	Are the employees satisfied?	Assessment of programmes and policies
CDB1	In the bank	The MISYS Company and the management of IT	The majority of employees are satisfied	Currently, there is no clear policy or plan in place for training and up-skilling
CDB2	In the bank	The MISYS Company and the management of IT	Fairly satisfied	There is a lack in training programs and up-skilling in the IT
CDB3	In the bank	The management of IT	Satisfied	There is no clear policy or plan in place for training and up-skilling
CDB4	In the bank	The management of IT	The employees are satisfied	External training is required to improve workforce performance and banking business performance
CDB5	In the bank	The MISYS Company at the beginning of use new system	In general the employees are satisfied	There is no clear policy or plan in place for training and up-skilling

Q2. What is the role that employees play in improving the AIS?

Respondents	Role of employees
CDB1	They have a role to improve the system by submitting their suggestions to the management
CDB2	They submit suggestions to the management for studying and implementing if possible
CDB3	They have a role to improve the system by submitting their suggestions to the management
CDB4	The management of IT receives any suggestion from operators of the system
CDB5	Rarely there are some exceptional employees who have submitted suggestions and implemented

Q3. To what extent do you think the training and up-skilling of the workforce is needed to realise the benefits of AIS adequately/satisfactorily?

Respondents	Need of training and up-skilling		
	Very required	Neutral	Not required
CDB1	It is very necessary		
CDB2	It is required and essential		
CDB3	It is very necessary		
CDB4	It is very required		
CDB5	It is essential and very important		

Q4. In general, to what extent do you think employees' skills in IT can help to improve business performance?

Respondents	Employees' skills in IT
CDB1	There is complete agreement that the skills of employees in IT lead to accuracy and speed of transactions. This will influence the business performance through increasing the number of transactions that are accomplished by the employees.
CDB2	Skilled employees in IT have a better performance than others; they sieve time and effort, and provide accurate and timely information. In addition, they deal with the largest number of transactions.
CDB3	The employees' skills influence positively on business performance through the improvement of service and speed up transactions and reduce errors.
CDB4	Skilled employee in IT is very helpful to improve business performance
CDB5	Employee's skills improve business performance through saving time and effort; it also improves the banking services.

Q5. In your opinion what are the effects of training and up-skilling of the workforce on the benefits delivery of investment in IT in your bank?

Respondents	Effects of training and up-skilling
CDB1	Since there are no clear policies and plans for training, its impact on the delivery of the benefits of investing in IT is not significant
CDB2	Due to the lack of proper selection of qualified, efficient and skilled staff, the impact on the delivery of the benefits of investing in IT is not significant
CDB3	Because of there are no policies and plans for training and up-skilling the workforce, so the impacts of the training and up-skilling is not significant
CDB4	The training and up-skilling the workforce has a positive impact on the delivery of the benefits of investing in IT in terms of accuracy of work and completion speed of transactions
CDB5	It has impact on the business performance, , through creation new services

Q6. Has the training and up-skilling of the workforce led to the following benefits? Please rank the benefits in terms of importance. (1 more important...etc)

Contributors	Yes	No	Frequency of the rank							Rank in total	
			1	2	3	4	5	6	7	*Average	Rank
Improve customer services	5		3	1	1					1.6	1
Raise the capacity to deal with the growth in number of transactions	5		1	2	1		1			2.2	2
Reduce a number of errors	5		1	1	1		2			3.2	3
Improve the accounting control in terms of accuracy and recording transactions	4	1		1	1	2				3.25	4
Improve working conditions and competition	5				1	1		1	2	5.4	5
Improve competitive advantage of the Bank	5					1	2	1	1	5.4	5
Reduce the number of employees	4	1				1		2	1	5.75	7

*to rank the users, the frequency of the rank was given weight as following: Σ FR x R / RN, where FR= Frequency of the rank, R= Rank and RN= number of Respondents.

Appendix No 5: Summary of respondents' answer (case study 2)

Case 2: Wahda Bank

I. The extent and nature of AIS investment

Q1. Could you describe the nature and attributes of the accounting information systems in your bank?

Age of Current AIS	1 to 5 years	5 to 10 years	Over 10 years
	5		
Designer of the system	Local designer	Foreign designer	Mixed
		5	
Implemented technology	Advanced	Average	Elementary
	5		
Computerisation of AIS	Computerised	Mixed	Manual
	5		

Q2. How would you characterise your bank's use of Information technology?

Statement	Yes	No
Competition at the cutting edge of innovation	1	4
Use IT as a competitive weapon		5
View IT as a critical and essential investment	2	3

Q3. What are the types of the information generated by the accounting system in your bank?

Types of information	Yes	No
Financial statement for external users	5	
Managerial reports for internal users	5	
Operational reports on business transactions	5	
statistical reports	5	
Top line information (EIS)		5
Information for board members (DSS)		5

Q4. Could you let me know about the most important problems and obstacles that arise during the operation of accounting information system and how do you cope with?

Problems and Obstacles	**WB1**	**WB2**	**WB3**	**WB4**	**WB5**
Kinds of these problems and obstacles	a problem in availability of information on time and operating and supporting the system	a problem in availability of information on time and some reports can not be obtained	a problem in availability of information on time, and a lack of accurate of information	a problem in availability of information on time	Shortfall in the availability, accuracy and quality of information
Maintenance and support the system	there are no specialists in support and maintenance advanced systems				
Reasons of theses problems	a lack of communication, there is a lack in qualified human element to operate the system and	a lack of expertise and a lake of communication and transferring from old system to the new system	incomplete of installation of the new system in all branches, the staff is not qualified or there is no good rehabilitation and a lack of communication infrastructure in the country	incomplete of installation of the new system in all branches	Incomplete of installation of the new system in all branches
Their relation with the bank or all Libyan bank	All Libyan banks		All Libyan banks		
Their relation with human or technical factors	Human Element and technical factors	Human Element and technical factors	Technical factors	Technical factors	Technical factors

Q5. Do you think the system is easy to use/ simple? Way?

Respondents	**Yes**	**No**	**Way?**
WB1	√		The system is clear and easy.
WB2	√		Because information can be obtained easily but it needs more training for employees.
WB3	√		If there is a good training.
WB4	√		The bank is using a part of the system, so it is easy and simple to use because it saves time and effort.
WB5	√		It needs qualified and specialised staff, because the system is clear and there are instructions for all banking transactions.

Q6. In your bank, what are the main areas of business which IT projects have covered?

Respondents	The main areas of business
WB1	All services are provided by the bank.
WB2	Documentary credits and assessment of the currency.
WB3	The most of banking business activities.
WB4	The most of banking business activities.
WB5	The bank now is applying the technology in the most of business areas.

Q7. Who are the users of the information generated by the accounting information system in your bank? Please rank the affirmative answers in order of frequency of use. (1 being the most frequent user...etc)

Users	Yes	No	Frequency of the rank							Rank in total	
			1	2	3	4	5	6	7	*Average	Rank
Bank top executives/Board members	5		3	1	1					1.6	1
Managers in your bank	5		1	2		1	1			2.8	2
Governmental bodies	5				3			1	1	4.4	3
Shareholders	5			1		1	2		1	4.6	4
Tax department in the finance ministry	4	1		1		1		1	1	4.75	5
Investors and creditors	4	1				2	1	1		4.75	5
Operatives, controllers, office staff	4	1			1	1		1	1	5	7

*to rank the users, the frequency of the rank was given weight as following: Σ FR x R / RN, where FR= Frequency of the rank, R= Rank and RN= number of Respondents.

II. The investment in AIS, business processes and business performance.

Q1. How would you assess the effectiveness and the efficiency of the accounting information system in your bank?

Statement	WB1	WB2	WB3	WB4	WB5
The important benefits that may be gained from efficient deployment of AIS.	It provides necessary information on time and saves time and effort, and The bank's performance improved	The speed of providing information to all users easily and accurately	Providing monthly reports and statistical to central bank and other governmental bodies.	It provides required information on time	It provides required information on time
The obstacles that keep you from being more effective AIS	training the staff on the new system	A lack training and skilled staff.	Delays in data entry as a result of incomplete of installation of the new system in all branches, and incomplete the link between branches		The communications a result of incomplete installation of the new system in all branches and networking between branches, and a lack of good training
Evaluate cost /benefit of accounting information system		Its benefits great comparing with its cost	Its benefits is greater especially in long term	Its benefits will be greater in long term	The benefits great comparing with its cost
The availability of information to all users (internal/ external)	Available on time to all users	Available to all users	Available to all users	Available on time to all users	Available on time to users

Q2. How does investment in information technology influence on the bank's reputation?

Respondents	Influences
WB1	A significant effect on the bank's reputation and creation new services
WB2	Increasing speed of completion of the transactions and providing new services
WB3	A significant impact on the bank's reputation
WB4	Helping the bank to achieve its goals and get competitive advantage
WB5	Saving time and effort

Q3. In your opinion, to what extent are the current accounting systems effective in supporting managers in decision-making and problem solving?

Respondents	Effectiveness
WB1	It is sufficient in supporting managers in decision-making and problem solving
WB2	It is sufficient in supporting managers in decision-making and problem solving
WB3	It is sufficient in supporting managers in decision-making and problem solving
WB4	It is not sufficient in supporting managers in decision-making and problem solving
WB5	It is sufficient in supporting managers in decision-making and problem solving

Q4. In your opinion, to what extent is there a need to develop the accounting information system in response to the development and changes in the Libyan business environment? (e.g. NPS)

Respondents	Need to develop
WB1	There is an urgent need to develop the AIS for providing a new services and meet customer requirements
WB2	The bank has changed its system in line with this development especially with the NPS project
WB3	There is an urgent need to develop the accounting information system
WB4	It is a necessary to develop accounting information system in response to the developments in Libyan business environment
WB5	There is a need to develop accounting information system at the same time with a development of IT

Q5. What role has information technology played in response to the competition that your bank has faced?

Respondents	Role of information technology
WB1	Due to the openness of the Libyan banks for foreign banks, the Central Bank of Libya led Libyan banks to develop banking technology and service development, where it adopted the NPS strategy to enable Libyan banks to compete with foreign banks to provide same services at same level.
WB2	It enabled the bank to use new products, keeping up with the competition, maintaining existing customers, obtaining new customers and completion rapid of services
WB3	IT leads to providing services to customers in quicker time, convenient manner, better quality and less effort and cost, thus these will give a competitive advantage to the bank.
WB4	Banking business depends on the information technology, thus if there was no investment in technology the bank will not be able to compete.
WB5	Meeting customers' requirements, reducing time of transactions accomplish maintaining existing customers and obtaining new customers.

Q6. In your opinion, how does the accounting information system in your bank develop business performance?

Respondents	Role of information technology	
	Level of IT is sufficient to improve business performance	**Is it is not sufficient, how can it be improved?**
WB1	The level of accounting information system now is sufficient.	After using of the data mining and data warehouse which is the next stage with skilled staff to develop business performance and support decision-making.
WB2	The level of accounting information system is not sufficient enough to improve business performance.	By training and up-skilling the employees for new system and develop the infrastructure of communications.
WB3	Now the level of the accounting information system is not enough to improve business.	It needs to good training in technology area, take advantage from advanced foreign banks in this area.
WB4	The accounting information system is not sufficient to develop business performance.	It could be improved through a completion of networking linkage between branches, and good training and up-skilling the employees.
WB5	The accounting information system is sufficient but need more efficiency to develop business performance.	It could be improved through a completion of networking linkage between branches.

Q7. What is the effect of the upgrade in IS /IT infrastructure on structure of the workforce and activities in your bank?

Respondents	Effects
WB1	It reduces time of transactions accomplishment and provides new areas of banking activities.
WB2	It provides new banking products and increases activities of bank.
WB3	It has positive effects on bank's income through improving existing services, providing new services, supporting security of system and saving time and effort.
WB4	It gives a big chance to develop banking services and providing new services.
WB5	It helps employees to accomplish their work well, and helps managers to assess performance of the employees and improves and develops quality of banking services.

Q8. How has the upgrade of IS/IT infrastructure impacted on banking transaction costs and the number of staff / branches?

Respondents	Impacts		
	On the banking transaction costs	**On the number of staff**	**On the number of branches**
WB1	Increased	No impact	No impact
WB2	increased	Decreased	No impact
WB3	Decreased	No impact	No impact
WB4	Decreased	Decreased	Increased
WB5	Decreased	Decreased	No impact

Q9. What are the factors driving investments in Information Technology in your bank? Please rank the affirmative factors in order of importance. (1 most important...etc).

Factors	Yes	No	Frequency of the rank								Rank in total	
			1	2	3	4	5	6	7	8	*Average	Rank
Improve and increase customer services	5		2	1	1	1					2.2	1
Increase internal efficiency	5		1	3						1	3	2
Increase understanding of customer needs	4	1	1		1	1		1			3.5	3
Cut service prices/lower service costs	4	1		1	2			1			3.5	3
Create overall market growth (create new demands)	4	1			1	1	1		1		4.75	5
Market share growth (take from competition)	5					2	2		1		5	6
Increase efficiency of business transactions	5		1						4		5.8	7
Defend current market share position	5						1	3		1	6.2	8

*to rank the users, the frequency of the rank was given weight as following: Σ FR x R / RN, where FR= Frequency of the rank, R= Rank and RN= number of Respondents.

Q10. Which of the following factors contribute to the success of your information technology bank? Please rank the contributors in order of importance. (1 most contributory...etc)

Contributors	Yes	No	Frequency of the rank								Rank in total	
			1	2	3	4	5	6	7	8	*Average	Rank
Supportive bank management/users	5		2	1		2					2.4	1
Technical skills of information system staff members	5		1	1	2				1		3.2	2
Customer service attitude towards information systems	3	2					1		1	1	3.67	3
Reduce cost and errors	4	1	1	1				1	1		4	4
Alignment of information system and business strategies	3	2		1	1				1		4	4
Adequate funding	5		1			1	1	2			4.4	6
Partnering with external service provider(s)	4	1			1	1	1	1			4.5	7
Provide quality and innovation services to the customer	5			1		1	2			1	4.8	8

*to rank the users, the frequency of the rank was given weight as following: Σ FR x R / RN, where FR= Frequency of the rank, R= Rank and RN= number of Respondents.

Q11. Please respond to the statements below using Yes or No and rank affirmative answers in order of importance. (1 more important...etc)

Statements	Yes	No	Frequency of the rank						Rank in total	
			1	2	3	4	5	6	*Average	Rank
Information technology gives your bank competitive advantage	5		1	2	2				2.2	1
Information technology provides a way for your bank to reduce costs	5		1	2	1	1			2.4	2
Information technology enables your bank to increase revenues	5		2		1	1		1	2.8	3
Information technology assists and supports the needs of your bank's business	5				1	1	3		4.4	4
Information technology plays an integral role in meeting customer requirements	5			1		2		2	4.4	4
Information technology is an important component and is aligned to your business strategy	5		1				2	2	4.6	6

*to rank the users, the frequency of the rank was given weight as following: Σ FR x R / RN, where FR= Frequency of the rank, R= Rank and RN= number of Respondents.

Q12. Does your bank make the following items available to implement, support and develop accounting information systems? Please rank the affirmative items in terms of their availability. (1 more available...etc).

Items	Yes	No	Frequency of the rank				Rank in total	
			1	2	3	4	*Average	Rank
Enough funds for on-going investment in AIS	4	1	3	1			1.25	1
Technical tools to develop and support AIS	5		1	2	2		2	2
Outside specialist experts when required	5			2	3		2.6	3
Skilled personal to implement and support the AIS	4	1	1			3	3.25	4

*to rank the users, the frequency of the rank was given weight as following: Σ FR x R / RN, where FR= Frequency of the rank, R= Rank and RN= number of Respondents.

Q13. Do you agree that the following benefits of the information technology banking services are evidenced by your bank? Pleas rank the evidenced benefits in terms of your agreement. (1 more important...etc).

Benefits	Yes	No	Frequency of the rank					Rank in total	
			1	2	3	4	5	*Average	Rank
IT banking services save your time	5		3	1	1			1.6	1
IT banking services provide accurate account information	4	1	1		2	1		2.75	2
IT banking services make your banking more convenient	5			3	1		1	2.8	3
It is easy to use IT banking services	4	1	1		1	1	1	3.25	4
IT banking services provide privacy in your banking transaction	5			1		3	1	3.8	5

*to rank the users, the frequency of the rank was given weight as following: Σ FR x R / RN, where FR= Frequency of the rank, R= Rank and RN= number of Respondents.

III. The importance of training and up-skilling of the workforce

Q1. In general, could you assess the training and up-skilling of the workforce programmes and policies related to AIS in your bank?

Respondents	Were the employees trained?	Who trained them?	Are the employees satisfied?	Assessment of programmes and policies
WB1	In the bank and trainer outside the bank	Bank's trainer and FLEXCUBE CO	Fairly satisfied	There is a lack in training programs in the IT and up-skilling area
WB2	In the bank and trainer outside the bank	Bank's trainer and FLEXCUBE CO	Not satisfied	There are many training programs, but random and ill-considered
WB3	In the bank	Bank's trainer	Satisfied	There are no training courses as a required level in terms of number and quality
WB4	In the bank	Bank's trainer	Fairly satisfied	There is no plan for training and up-skilling the workforce
WB5	In the bank and trainer outside the bank	Bank's trainer and FLEXCUBE CO	Fairly satisfied	Still obtaining advantage of the courses training is not good

Q2. What is the role that employees play in improving the AIS?

Respondents	Role of employees
WB1	There is a special committee to study the proposals submitted by employees to improve the system and adoption the appropriate of them
WB2	The employees submit their opinions to the management about the new system
WB3	There is a role of employees in improving AIS by submitting their suggestions to the management.
WB4	There were teams of senior officials in the bank. They suggested some changes about the new system
WB5	Through submission their suggestions and notes to the management

Q3. To what extent do you think the training and up-skilling of the workforce is needed to realise the benefits of AIS adequately/satisfactorily?

Respondents	Extent of need		
	Very required	**Neutral**	**Not required**
WB1	Very important		
WB2	Very important		
WB3	Very important		
WB4	Very required		
WB5	Very important		

Q4. In general, to what extent do you think employees' skills in IT can help to improve business performance?

Respondents	Employees' skills in IT
WB1	It is very important to improve business performance through using the capabilities of the system better use. However, the bank suffers from a lack of qualified and skilled staff.
WB2	It is very important to improve business performance. However, highly skilled staff has a disadvantage if it is used bad use, especially when a staff is more skilled than their manager, thus the skills should be equal.
WB3	Employees' skills in IT are greatly helpful to improve business performance with an accounting qualification. They lead to expedite the completion of work and provide accuracy information in time.
WB4	there is a greater need for skilled staff in technology, skills in IT lead to a speed and accuracy of business and hence obtain a good quality of information and thus help to improve business performance
WB5	It is greatly helpful to improve business performance, through providing information, saving time and organising work as well.

Q5. In your opinion what are the effects of training and up-skilling of the workforce on the benefits delivery of investment in your bank?

Respondents	Effects of training and up-skilling
WB1	There are no significant effects because training and up-skilling now is weak comparing with the high level of available technology.
WB2	It has a positive impact but not as planed because the random of candidature of trainees.
WB3	It has a positive impact through reducing errors and expediting the completion of business.
WB4	The lack of a good training and bad nominations of training have led to a lack of achieving the benefits of investing in information system in the bank
WB5	The training after using the new system has a good impact on the delivery of the benefits of investing in IT

Q6. Has the training and up-skilling of the workforce led to the following benefits? Please rank the benefits in terms of importance. (1 more important...etc)

Benefits	Yes	No	Frequency of the rank							Rank in total	
			1	2	3	4	5	6	7	*Average	Rank
Improve customer services	3	2	1	2						1.67	1
Improve the accounting control in terms of accuracy and recording transactions	5		3			1		1		2.6	2
Raise the capacity to deal with the growth in number of transactions	3	2	1		1	1				2.67	3
Reduce a number of errors	4	1		2				2		4	4
Improve competitive advantage of the Bank	3	2			1	1	1			4	4
Improve working conditions and competition	3	2			1		2			4.33	6
Reduce the number of employees	2	3							2	7	7

*to rank the users, the frequency of the rank was given weight as following: Σ FR x R / RN, where FR= Frequency of the rank, R= Rank and RN= number of Respondents.

Appendix No 6: Summary of respondents' answer (case study 3)

Case 3: Alegmaa Alarabi Bank

I. The extent and nature of AIS investment

Q1. Could you describe the nature and attributes of the accounting information systems in your bank?

Age of Current AIS	1 to 5 years	5 to 10 years	Over 10 years
		5	
Designer of the system	Local designer	Foreign designer	Mixed
	5		
Implemented technology	Advanced	Average	Elementary
			5
Computerisation of AIS	Computerised	Mixed	Manual
	2	3	

Q2. How would you characterise your bank's use of Information technology?

Statement	Yes	No
Competition at the cutting edge of innovation		5
Use IT as a competitive weapon		5
View IT as a critical and essential investment	4	1

Q3. What are the types of the information generated by the accounting system in your bank?

Types of information	Yes	No
Financial statement for external users	4	1
Managerial reports for internal users	5	
Operational reports on business transactions	5	
Statistical reports	5	
Top line information (EIS)		5
Information for board members (DSS)		5

Q4. Could you let me know about the most important problems and obstacles that arise during the operation of accounting information system and how do you cope with?

Problems and Obstacles	AB1	AB2	AB3	AB4	AB5
Kinds of these problems and obstacles	The availability of information and lack of data quality.	Supporting and operation of the system	Some operating malfunctions	Some failures in the system, it does not cover some banking activities and the system is rented	Delay of obtaining information
Maintenance and support the system	Company designed the system	Company designed the system	Company designed the system	Company designed the system	Company designed the system
Reasons of theses problems	linkage between devices in the branches and lack of training	Supporting and operation the system	Interruption of communicatio n	The system has a limited capabilities lack of training and up-skilling	Non-linkage between branches
Their relation with the bank or all Libyan bank	The bank	The bank	All Libyan banks	All Libyan banks	The bank
Their relation with human or technical factors	Human and technical	Technical	Technical	Technical	Technical

Q5. Do you think the system is easy to use/ simple? Way?

Respondents	Yes	No	Way?
AB1	√		Because it is not a highly advanced
AB2	√		Because it is basic and not highly developed
AB3	√		Because it is uncomplicated
AB4	√		Because it is simple and in Arabic
AB5	√		Because it is simple and uncomplicated

Q6. In your bank, what are the main areas of business which IT projects have covered?

Respondents	The main areas of business
AB1	The most of bank's activities except some area such as ATMs, Visa cards, mobile banking and linkage between the branches
AB2	some bank's activities
AB3	The most of currently bank's activities
AB4	The most of bank's activities except some area such as ATMs, Visa cards, and there is not the linkage networking between the branches
AB5	Some bank's activities such as treasury and current accounts activities.

Q7. Who are the users of the information generated by the accounting information system in your bank? Please rank the affirmative answers in order of frequency of use. (1 being the most frequent user...etc)

Users	Yes	No	Frequency of the rank							Rank in total	
			1	2	3	4	5	6	7	*Average	Rank
Managers in your bank	5		2	2	1					1.8	1
Bank top executives/Board members	5		1	2	2					2.2	2
Operatives, controllers, office staff	5		1	1	1			1	1	3.8	3
Shareholders	4	1	1			1	1	1		4	4
Governmental bodies	5				1	1	2		1	4.8	5
Investors and creditors	4	1				2	1		1	5	6
Tax department in the finance ministry	5					1	1	3		5.4	7

*to rank the users, the frequency of the rank was given weight as following: Σ FR x R / RN, where FR= Frequency of the rank, R= Rank and RN= number of Respondents.

II. The investment in AIS, business processes and business performance.

Q1. How would you assess the effectiveness and the efficiency of the accounting information system in your bank?

Statement	AB1	AB2	AB3	AB4	AB5
The important factors that may influence the efficiency in the deployment of AIS	It is not effective and efficient enough	It is effective and efficient because it is easy to use and provides required information	The system is effective in terms of providing required information	fairly effective and efficient with respect to current banking business	The system is not effective and efficient
The obstacles that keep you from being more effective AIS	The system capabilities are finite to deal with huge volume of data and it does not provide required information to internal users in time	Networking between branches	the linkage between branches	Capabilities of the current system are limited	It is simple and does not keep pace with the evolving banking
Evaluate cost /benefit of accounting information system	The cost of system is high and needs to develop or change.	Spending for IT is not enough to obtain the benefits of AIS	The benefits greater than its cost	Its cost is not high comparing with its benefits	Good comparing with its cost
The availability of information to all users (internal/ external)	Available to internal	Available to internal	Available to all users	Available to all users	Delay of obtaining information

Q2. How does investment in information technology influence on the bank's reputation?

Respondents	Influences
AB1	Providing better services and thus increasing income.
AB2	Providing new services and saving customers' time through speed accomplish of transaction
AB3	Providing faster services and more convenient, hence obtaining a competitive advantage
AB4	Providing quick and accurate information to management, investors and customers, thus it gives more confidence to the customers of the bank
AB5	Providing faster services and more convenient , and helps to provide information to decision maker on time

Q3. In your opinion, to what extent are the current accounting systems effective in supporting managers in decision-making and problem solving?

Respondents	Effectiveness
AB1	It is fairly effective in supporting managers especially in credit area.
AB2	It is fairly effective in supporting managers especially in credit decisions.
AB3	The system is consumedly effective in supporting managers especially in the credit decisions.
AB4	The current system is good especially regarding to decisions of credit and investment.
AB5	It is not effective in supporting managers in decision-making and problem solving, because there is a delay of obtaining information.

Q4. In your opinion, to what extent is there a need to develop the accounting information system in response to the development and changes in the Libyan business environment? (e.g. NPS)

Respondents	Need to develop
AB1	There is a significant need to develop AIS; The management is seeking to develop the system because there are some areas in the NPS project, which should be applied by the bank.
AB2	There is an urgent need to develop AIS
AB3	It is necessary to convoy this development through developing the system and networking between branches
AB4	There is a significant need to develop its information system in the bank and linkage networking between all bank branches
AB5	There is an urgent need to develop AIS

Q5. What role has information technology played in response to the competition that your bank has faced?

Respondents	Role of information technology
AB1	Providing good and comfort services, thus it leads to maintaining existing customer and obtaining new customers. It also enables the bank to use new products and improving existing services
AB2	The customers need now the speed accomplish of transaction regardless price of the service, thus the number of customer will be increased and the income will be increased as well.
AB3	It has a significant role in the competition, speed of transaction accomplishment and providing good services to the customers
AB4	Saving time and effort, facilitates accomplishment of transactions, leads to obtain a new customers and investors, thus obtain a competitive advantage.
AB5	it enables the bank to obtain competitive advantage among other banks and helping manager in decision-making

Q6. In your opinion, how does the accounting information system in your bank develop business performance?

Respondents	Role of information technology	
	Level of IT is sufficient to improve business performance	Is it is not sufficient, how can it be improved?
AB1	It is not sufficient to improve business performance, because the bank can not provide some banking activities	The business performance can be improved by adopting developed information technology
AB2	It is fairly sufficient to develop business performance	It can be improved by investment in advanced technology
AB3	It is enough in terms of the current banking, but in terms of customer services is not enough	Obtaining developed system
AB4	It is not enough for developing the business performance, because it does not meet the needs of external users such as customers and investors	It can be improved by adopting advanced technology
AB5	It is not enough for developing the business performance	Development and training workforce and then obtaining advanced system

Q7. What is the effect of the upgrade in IS /IT infrastructure on structure of the workforce and activities in your bank?

Respondents	Effects
AB1	Increasing activities of business.
AB2	Creating new banking activities and improving existing services.
AB3	Improving business performance, increasing banking business accuracy and increasing business activities.
AB4	Improving existing services and introducing new and convenient services.
AB5	It provides huge volume of information, enables the bank to expand by opining new branches, and provides new services and developing banking business.

Q8. How has the upgrade of IS/IT infrastructure impacted on banking transaction costs and the number of staff / branches?

Respondents	Impacts		
	On the banking transaction costs	On the number of staff	On the number of branches
AB1	Decreased	Decreased	Increased
AB2	Decreased	Decreased	Increased
AB3	Decreased	Decreased	Increased
AB4	Decreased	Decreased	No impact
AB5	Decreased	Decreased	Increased

Q9. What are the factors driving investments in Information Technology in your bank? Please rank the affirmative factors in order of importance. (1 most important...etc).

Factors	Yes	No	Frequency of the rank								Rank in total	
			1	2	3	4	5	6	7	8	*Average	Rank
Improve and increase customer services	5		4		1						1.4	1
Cut service prices/lower service costs	5			2		2	1				3.4	2
Increase internal efficiency	5			1	3			1			3.4	2
Increase understanding of customer needs	5			1	1	1	1	1			4	4
Market share growth (take from competition)	3	2	1			1			1		4	4
Defend current market share position	3	2		1			1			1	5	6
Increase efficiency of business transactions	5					1	1	1	2		5.8	7
Create overall market growth (create new demands)	5						2	1		2	6.4	8

*to rank the users, the frequency of the rank was given weight as following: Σ FR x R / RN, where FR= Frequency of the rank, R= Rank and RN= number of Respondents.

Q10. Which of the following factors contribute to the success of your information technology bank? Please rank the contributors in order of importance. (1 most contributory...etc)

Contributors	Yes	No	Frequency of the rank								Rank in total	
			1	2	3	4	5	6	7	8	*Average	Rank
Adequate funding	4	1	2	1		1					2	1
Technical skills of information system staff members	5		2	1			1	1			3	2
Supportive bank management/users	5			1	2		2				3.6	3
Alignment of information system and business strategies	5			1	2			2			4	4
Provide quality and innovation services to the customer	5		1	1			1		1	1	4.6	5
Reduce cost and errors	5					2		1	1	1	5.8	6
Customer service attitude towards information systems	5					1	1	1	2		5.8	6
Partnering with external service provider(s)	3	2			1					2	6.3	8

*to rank the users, the frequency of the rank was given weight as following: Σ FR x R / RN, where FR= Frequency of the rank, R= Rank and RN= number of Respondents.

Q11. Please respond to the statements below using Yes or No and rank affirmative answers in order of importance. (1 more important...etc)

Statements	Yes	No	Frequency of the rank						Rank in total	
			1	2	3	4	5	6	*Average	Rank
Information technology gives your bank competitive advantage	4	1	1		2	1			2.75	1
Information technology provides a way for your bank to reduce costs	5		1	2		1	1		2.8	2
Information technology plays an integral role in meeting customer requirements	5		1	1	1			2	3.6	3
Information technology assists and supports the needs of your bank's business	5		1		1	2		1	3.6	3
Information technology is an important component and is aligned to your business strategy	5			2			3		3.8	5
Information technology enables your bank to increase revenues	5		1		1	1	1	1	4	6

*to rank the users, the frequency of the rank was given weight as following: Σ FR x R / RN, where FR= Frequency of the rank, R= Rank and RN= number of Respondents..

Q12. Does your bank make the following items available to implement, support and develop accounting information systems? Please rank the affirmative items in terms of their availability. (1 more available...etc).

Items	Yes	No	Frequency of the rank				Rank in total	
			1	2	3	4	*Average	Rank
Technical tools to develop and support AIS	5		3	1		1	1.8	1
Skilled personal to implement and support the AIS	5		1	2	2		2.2	2
Enough funds for on-going investment in AIS	5		1	2	1	1	2.4	3
Outside specialist experts when required	3	2			2	1	3.3	4

*to rank the users, the frequency of the rank was given weight as following: Σ FR x R / RN, where FR= Frequency of the rank, R= Rank and RN= number of Respondents.

Q13. Do you agree that the following benefits of the information technology banking services are evidenced by your bank? Pleas rank the evidenced benefits in terms of your agreement. (1 more important…etc).

Benefits	Yes	No	Frequency of the rank					Rank in total	
			1	2	3	4	5	*Average	Rank
IT banking services save your time	5		2	1	2			2	1
IT banking services make your banking more convenient	5		1	3		1		2.2	2
IT banking services provide accurate account information	5		2		1	1	1	2.8	3
It is easy to use IT banking services	5			2		2	1	3.4	4
IT banking services provide privacy in your banking transaction	5				1	1	3	4.4	5

*to rank the users, the frequency of the rank was given weight as following: Σ FR x R / RN, where FR= Frequency of the rank, R= Rank and RN= number of Respondents.

III. The importance of training and up-skilling of the workforce

Q1. In general, could you assess the training and up-skilling of the workforce programmes and policies related to AIS in your bank?

Respondents	Were the employees trained?	Who trained them?	Are the employees satisfied?	Assessment of programmes and policies
AB1	During operation of the system		Satisfied	There are no training programmes
AB2	During operation of the system		Satisfied	There are no training programmes
AB3	During operation of the system		Satisfied	There are no training programmes
AB4	During operation of the system		Satisfied	It is not as must be
AB5	During operation of the system.		Satisfied	There is no any training policy

Q2. What is the role that employees play in improving the AIS?

Respondents	Role of employees
AB1	Through submit their suggestions to add or modify some reports for more details
AB2	There is suggestions form that are studied and applied after approval of the management
AB3	The employees submit their suggestions through proposals form to the management
AB4	Through submit their suggestions to the management
AB5	The employees submit their suggestion to the management by suggestions form

Q3. To what extent do you think the training and up-skilling of the workforce is needed to realise the benefits of AIS adequately/satisfactorily?

Respondents	Extent of need		
	Very required	Neutral	Not required
AB1	Very required		
AB2	Very important		
AB3	Very required		
AB4	Very important		
AB5	Required		

Q4. In general, to what extent do you think employees' skills in IT can help to improve business performance?

Respondents	Employees' skills in IT
AB1	Employees' skills help to improve business performance through a speed of transaction accomplishment. The skilled employees in IT avoid a lot of problems during operation of inputting data.
AB2	Employees' skills are very helpful to improve business performance because it makes tasks of supporter easer, and thus saves effort and time, and improves business performance
AB3	There is positive relationship between employees' skills and business performance through their good using and dealing with the information system.
AB4	Employees' skills help to improve business performance and saves time and effort of employees in terms of raising speed, accuracy and efficiency
AB5	Skilled employees help to improve business performance through a speed of transaction accomplishment, and they provide required information on time, these lead to decreasing of transaction cost.

Q5. In your opinion what are the effects of training and up-skilling of the workforce on the benefits delivery of investment in your bank?

Respondents	Effects of training and up-skilling
AB1	Training and up-skilling has a positive impact on efficiency of employees and increasing a speed completion of transactions
AB2	there are no effects of training and up-skilling the workforce on the delivery of the benefits of investing in IT in the bank
AB3	Training and up-skilling has a positive impact, where it leads to increasing efficiency of employees and improving business performance
AB4	the training and up-skilling has a positive impact on the delivery of some benefits of investing in IT
AB5	The current training and up-skilling suffice the current requirements, but it does not lead to development of banking business

Q6. Has the training and up-skilling of the workforce led to the following benefits? Please rank the benefits in terms of importance. (1 more important...etc)

Benefits	Yes	No	Frequency of the rank							Rank in total	
			1	2	3	4	5	6	7	*Average	Rank
Improve customer services	5		2	1	1	1				2.2	1
Raise the capacity to deal with the growth in number of transactions	5		1	1	2	1				2.6	2
Reduce a number of errors	5		1	1	1	2				2.8	3
Improve working conditions and competition	4	1	1	1			1		1	3.75	4
Improve the accounting control in terms of accuracy and recording transactions	4	1		1	1			1	1	4.5	5
Improve competitive advantage of the Bank	4	1					2	2		5.5	6
Reduce the number of employees	4	1					1	1	2	6.25	7

*to rank the users, the frequency of the rank was given weight as following: Σ FR x R / RN, where FR= Frequency of the rank, R= Rank and RN= number of Respondents.

Appendix No 7: Interview (1): Commerce and development bank

I. General questions:

- The respondent's name and position?
  Waseem El-Zawey, Manager of Administrative Affairs Management in Commerce and Development Bank
- How long is length of experience?
  13 years
- Highest level of education and qualifications.
  Bachelor of Business Administration

II. The extent and nature of AIS investment (RESEARCH QUESTION 1):

The Semi-structured interview questions:

1. Could you describe the nature and attributes of the accounting information systems in your bank?
   Since the establishment of the bank in 1996 until 2004, accounting information systems which were used in the bank were designed by local companies. From 2004 until now, the bank has used a global accounting information system which is called MISYS system. However, as this system is huge and very developed, the bank now does not use more than 25% of its capability. In 2004, the Commerce and Development Bank was the first bank in Libya to issue Visa card, and use ATMs, points of sale, electronic banks and mobile banks. In addition, in 2008 all branches and agencies became connected through a fibre optic network. This feature enabled customers to conduct their banking transactions in any branch and agency regardless of where the account was located.

2. How would you characterise your bank's use of Information Technology (IT)?
   The Commerce and Development Bank is interested in the area of information technology. The bank also views IT as a critical and essential investment area due to the fact that the bank competes at the cutting edge of innovation and uses IT as a competitive weapon.

3. What are the types of the information generated by the accounting system in your bank?
   The accounting information system provides financial statements for external users, managerial reports for internal users, and operational reports on business transactions for operatives and controllers. In addition, the system provides required information to all levels of management in an easy and accessible way. Board members every day receive reports of the financial situation and daily activities of the bank and its branches.

4. Could you let me know about the most important problems and obstacles that arise during the operation of the accounting information system and how you cope with them?
   The most important problems are related to human resources, where there are no specialists in technology in the field of accounting. Consequently, the management hires experts from outside the bank to support and maintain the system. In addition, a lack of a communications infrastructure in the state is one of the most important problems that face all Libyan banks.

5. Do you think the system is easy to use/ simple? Why? Why not?
   The system is easy and uncomplicated, and just needs a bit of training, because it is easy to use and simply available to all.

6. In your bank, what are the main areas of business which IT projects have covered?
   All main areas of business in the bank have been covered by information technology projects.

The Checklist Questions:

1. Who are the users of the information generated by the accounting information system in your bank? Please rank the affirmative answers in order of frequency of use. (1 being the most frequent user...etc)

Users	Yes	No	Rank
Shareholders	√		6
Governmental bodies	√		2
Tax department in the finance ministry	√		1
Managers in your bank	√		5
Investors and creditors	√		7
Operatives, controllers, office staff	√		4
Bank top executives/Board members	√		3

III. About the investment in AIS, business processes and business performance (RQ2):

The Semi-structured interview questions:

1. How would you assess the effectiveness and the efficiency of the accounting information system in your bank?
   The system is efficient and effective and accurate information is available on time to all internal and external users. However, the main obstacle that keeps the bank from having an effective accounting information system is human resources. The benefits of the accounting information system outweigh its cost.

2. How does investment in information technology influence on the bank's reputation?
   Costumer numbers have increased by providing new and fast services. This influence leads to an increase in the income and market value, as well as a good reputation for the bank.
3. In your opinion, to what extent are the current accounting systems effective in supporting managers in decision-making and problem solving? Please give examples as appropriate.
   The system is very effective in supporting managers because it provides all information required by managers about all branches and agencies on time.

4. In your opinion, to what extent is there a need to develop the accounting information system in response to the development and changes in the Libyan business environment? (e.g. NPS)
   Compared with other Libyan banks, the Commerce and Development Bank is advanced in its use of information technology. In addition, they try keep up with us in this area. The bank is also connected with the some elements of the NPS and with other Libyan banks.

5. What role has information technology played in response to the competition that your bank has faced?
   Information technology has an essential part to play in the competition which the bank has faced with the largest banks in terms of capital and age.

6. In your opinion, how does the accounting information system in your bank develop business performance?

Through providing the accurate and timely information which is provided by the system, the bank's management can make a right decision at an appropriate time. This situation improves the speed and accuracy of transactions and thus improves the business performance. However, by training and up skilling the workforce the accounting information system will be more able to improve business performance,

7. What is the effect of the upgrade in IS /IT infrastructure on the structure of the workforce and activities in your bank?
   The upgrade in IS/IT infrastructure has provided new services, and improved existing services and the accomplishment of transactions. In addition, it has led to an increase in income and customers.

8. How has the upgrade of IS/IT infrastructure impacted on banking transaction costs and the number of staff / branches? Please explain.
   The upgrade in IS/IT infrastructure has led to a decrease in the number of staff and the cost of transactions, thus increasing income. However, regarding the number of branches, there is no relationship between information technology and number of branches.

The Checklist Questions:

1. From the list below, what are the factors driving investments in Information Technology in your bank? Please rank the affirmative factors in order of importance. (1 most important…etc).

Factors	**Yes**	**No**	**Rank**
Create overall market growth (create new demands)	√		5
Market share growth (take from competition)	√		7
Defend current market share position	√		8
Improve and increase customer services	√		1
Cut service prices/lower service costs	√		6
Increase internal efficiency	√		4
Increase understanding of customer needs	√		2
Increase efficiency of business transactions	√		3

2. Which of the following factors contribute to the success of your information technology bank? Please rank the contributors in order of importance. (1 most contributory...etc)

Contributors	**Yes**	**No**	**Rank**
Technical skills of information system staff members	√		3
Alignment of information system and business strategies	√		5
Customer service attitude towards information systems	√		6
Supportive bank management/users	√		4
Partnering with external service provider(s)	√		8
Adequate funding	√		7
Reduce cost and errors	√		1
Provide quality and innovation services to the customer	√		2

3. Please respond to the statements below using Yes or No and rank affirmative answers in order of importance. (1 more important...etc)

Statements	Yes	No	Rank
Information technology enables your bank to increase revenues	√		1
Information technology provides a way for your bank to reduce costs	√		2
Information technology gives your bank competitive advantage	√		3
Information technology assists and supports the needs of your bank's business	√		6
Information technology is an important component and is aligned to your business strategy	√		5
Information technology plays an integral role in meeting customer requirements	√		4

4. Does your bank make the following items available to implement, support and develop accounting information systems? Please rank the affirmative items in terms of their availability. (1 more available...etc).

Items	Yes	No	Rank
Enough funds for on-going investment in AIS	√		1
Technical tools to develop and support AIS	√		2
Outside specialist experts when required	√		3
Skilled personal to implement and support the AIS	√		4

5. Do you agree that the following benefits of the information technology banking services are evidenced by your bank? Pleas rank the evidenced benefits in terms of your agreement. (1 more important…etc).

Benefits	Yes	No	Rank
It is easy to use IT banking services	√		5
IT banking services save your time	√		2
IT banking services make your banking more convenient	√		1
IT banking services provide privacy in your banking transaction	√		4
IT banking services provide accurate account information	√		3

IV. The importance of training and up-skilling of the workforce (RQ3)

1. In general, could you assess the training and up-skilling of the workforce programmes and policies related to AIS in your bank?
   There is no clear policy or plan in place for training and up-skilling in the bank. However, in the near future, there will be a comprehensive plan for internal and external training.
   The MISYS Company and the management of information technology in the bank have trained bank employees for the new system. The majority of employees are satisfied with the new system.

2. What is the role that employees play in improving the AIS?
   During the operation of the system by employees, they have a role to improve the system by submitting their suggestions to the management.

3. To what extent do you think the training and up-skilling of the workforce is needed to realise the benefits of AIS adequately/satisfactorily?
   To achieve the benefits of AIS adequately and satisfactorily, the training and up-skilling of the workforce is necessary, especially before using new services or advanced technology.

4. In general, to what extent do you think employees' skills in IT can help to improve business performance?
   There is complete agreement that the skills of employees in IT lead to accuracy and speed of transactions. This will influence the business performance through increasing the number of transactions that are accomplished by the employees.

5. In your opinion what are the effects of training and up-skilling the workforce on the delivery of the benefits of investing in IT in your bank?
   Since there are no clear policies and plans for training, its impact on the delivery of the benefits of investing in IT is not significant.

The Checklist Questions:

1. Has the training and up-skilling of the workforce led to the following benefits? Please rank the benefits in terms of importance. (1 more important...etc)

Benefits	Yes	No	Rank
Improve customer services	√		3
Raise the capacity to deal with the growth in number of transactions	√		1
Improve working conditions and competition	√		4
Improve the accounting control in terms of accuracy and recording transactions		√	
Reduce the number of employees		√	
Reduce a number of errors	√		2
Improve competitive advantage of the Bank	√		5

Appendix No 8: Interview (2): Commerce and development bank

I. General questions:

- The respondent's name and position
  Khalid Derbee, General Manager of Commerce and Development Bank
- How long is length of experience?
  33 years
- Highest level of education and qualifications.
  Bachelor of Business Administration

II. The extent and nature of AIS investment (RESEARCH QUESTION 1):

The Semi-structured interview questions:

1. Could you describe the nature and attributes of the accounting information systems in your bank?
   From 2004 until now, the bank has used a global accounting information system which is called MISYS system. Compared with other banks, our bank uses IT at the highest level. The Commerce and Development Bank was the first bank in Libya to issue a Visa cards, and use ATMs, points of sale, electronic banks and mobile banks. Recently, the bank has used mobile banks for transferring money from on account to another. In addition, in 2008, all branches and agencies became connected through a fibre optic network. This feature enabled customers to conduct their banking transactions in any branch and agency regardless of where the account was located. Moreover, there is full computerisation of the accounting system in the bank.

2. How would you characterise your bank's use of Information Technology (IT)?

   There is a large investment in the IT area. Owing to the fact that the bank works among banks that have greater capital and have more banking experience, the bank views IT as a critical and essential investment area. The management of the bank keep pace with new development in the area of IT and try to apply it in Libya; therefore the bank is distinguished from other banks in this area.

3. What are the types of the information generated by the accounting system in your bank?

   The accounting information system provides financial and statistical reports for external users and internal users in timely and operational reports on business transactions for operatives and controllers. In addition, the system provides required information to all levels of management in an easy and accessible way. On daily basis board members receive required information about the financial situation and banking activities. In addition, they can also use the system independently to get needed information.

4. Could you let me know about the most important problems and obstacles that arise during the operation of the accounting information system and how you cope with them?

   The main problems are the education level of the employees, where there is a shortage of qualified human resources and there is a lack of employees training. In addition, a lack of a communications in the country prevents the banks from doing business better, especially in ATMs. These are the most important problems that face all Libyan banks.

5. Do you think the system is easy to use/ simple? Why? Why not?
   Operation of the system is not difficult with repetition and time because all banking operations are available in the system and it just needs a qualified person.

6. In your bank, what are the main areas of business which IT projects have covered?
   All main areas of banking business in the bank have been covered by information technology projects.

The Checklist Questions:

1. Who are the users of the information generated by the accounting information system in your bank? Please rank the affirmative answers in order of frequency of use. (1 being the most frequent user...etc)

Users	Yes	No	Rank
Shareholders		√	
Governmental bodies		√	
Tax department in the finance ministry	√		5
Managers in your bank	√		2
Investors and creditors	√		4
Operatives, controllers, office staff	√		3
Bank top executives/Board members	√		1

III. The investment in AIS, business processes and business performance (RQ2):

The Semi-structured interview questions:

1. How would you assess the effectiveness and the efficiency of the accounting information system in your bank?
   The system is efficient and effective. It saves time and effort by providing required information on time to internal and external users. The problems that may face the bank are the mistakes which are made by the staff as a result of lack of efficiency. These problems may keep the bank from having an effective accounting information system.
   On the other hand, in spite of the cost, there is substantial saving by the use of IT, especially in the long term, where there are many benefits from the use of the system.

2. How does investment in information technology influence the bank's reputation?
   As a result of using IT, the developed services that are provided by the bank, the bank's reputation have been increased, which increases interest of customers to deal with the bank.

3. In your opinion, to what extent are the current accounting systems effective in supporting managers in decision-making and problem solving? Please give examples as appropriate.
   The system is very useful in supporting managers to make decisions and solve problems. However, I recommend that the system should involve personal information about customers to make decisions more accurately, especially regarding decisions of credit.

4. In your opinion, to what extent is there a need to develop the accounting information system in response to the development and changes in the Libyan business environment? (e.g. NPS)
   The bank is connected with the some elements of the NPS for example, Real Time Gross Settlement System (RTGS) and Automated Clearing House (ACH). The bank is also connected with other Libyan banks. Although this connectivity is costly for the bank it is necessary for the bank to keep its customers.

5. What role has information technology played in response to the competition that your bank has faced?
   IT has a great role to play in the competition. This was the first bank in Libya to use IT, for example, ATM, Visa Cards, and the connections between all bank branches. These led us to obtain new customers to the bank and to maintain existing customers.

6. In your opinion, how does the accounting information system in your bank develop business performance?
   Through providing accurate and timely information which is provided by the system to internal and external users, the level of accounting information system in the bank is sufficient to improve business performance.

7. What is the effect of the upgrade in IS /IT infrastructure on the structure of the workforce and activities in your bank?
   The upgrade in IS/IT infrastructure has provided new services, improved existing services and made the accomplishment of transactions more accurate and speed.

8. How has the upgrade of IS/IT infrastructure impacted on banking transaction costs and the number of staff / branches? Please explain.
   The upgrade in IS/IT infrastructure has led to a decrease in the number of staff and the cost of transactions. However, the upgrade of IS/IT infrastructure has had no impact on the number of branches.

The Checklist Questions:

1. From the list below, what are the factors driving investments in Information Technology in your bank? Please rank the affirmative factors in order of importance. (1 most important…etc).

Factors	Yes	No	Rank
Create overall market growth (create new demands)	√		1
Market share growth (take from competition)	√		2
Defend current market share position	√		7
Improve and increase customer services	√		3
Cut service prices/lower service costs	√		4
Increase internal efficiency	√		5
Increase understanding of customer needs	√		6
Increase efficiency of business transactions	√		8

2. Which of the following factors contribute to the success of your information technology bank? Please rank the contributors in order of importance. (1 most contributory...etc)

Contributors	Yes	No	Rank
Technical skills of information system staff members	√		1
Alignment of information system and business strategies	√		7
Customer service attitude towards information systems	√		8
Supportive bank management/users	√		2
Partnering with external service provider(s)	√		3
Adequate funding	√		4
Reduce cost and errors	√		5
Provide quality and innovation services to the customer	√		6

3. Please respond to the statements below using Yes or No and rank affirmative answers in order of importance. (1 more important...etc)

Statements	Yes	No	Rank
Information technology enables your bank to increase revenues	√		1
Information technology provides a way for your bank to reduce costs	√		2
Information technology gives your bank competitive advantage	√		3
Information technology assists and supports the needs of your bank's business	√		4
Information technology is an important component and is aligned to your business strategy	√		5
Information technology plays an integral role in meeting customer requirements	√		6

4. Does your bank make the following items available to implement, support and develop accounting information systems? Please rank the affirmative items in terms of their availability. (1 more available...etc).

Items	Yes	No	Rank
Enough funds for on-going investment in AIS	√		1
Technical tools to develop and support AIS	√		2
Outside specialist experts when required	√		3
Skilled personal to implement and support the AIS	√		4

5. Do you agree that the following benefits of the information technology banking services are evidenced by your bank? Pleas rank the evidenced benefits in terms of your agreement. (1 more important…etc).

Benefits	Yes	No	Rank
It is easy to use IT banking services	√		1
IT banking services save your time	√		3
IT banking services make your banking more convenient	√		4
IT banking services provide privacy in your banking transaction	√		5
IT banking services provide accurate account information	√		2

IV. The importance of training and up-skilling of the workforce (RQ3)

1. In general, could you assess the training and up-skilling of the workforce programmes and policies related to AIS in your bank?
   There is a lack in training programs and up-skilling in the IT area in the bank. The management of information technology organises training courses for employees. In the case of new systems, employees were trained by the companies that designed the systems.
   The employees are only fairly satisfied with the new system because of their lack of skills and training.

2. What is the role that employees play in improving the AIS?
   During the operation of the system by the employees, they submit suggestions to the management. There is a specialised committee for studying and implementing if possible.

3. To what extent do you think the training and up-skilling of the workforce is needed to realise the benefits of AIS adequately/satisfactorily?
   The training and up-skilling is required and essential to realise the benefits of AIS, because with out training and developing the bank can not achieve the benefits adequately and satisfactorily.

4. In general, to what extent do you think employees' skills in IT can help to improve business performance?
   Skilled employees in IT have a better performance than others; they sieve time and effort, and provide accurate and timely information. In addition, they deal with the largest number of transactions.

5. In your opinion what are the effects of training and up-skilling the workforce on the delivery of the benefits of investing in IT in your bank?
   Due to the lack of proper selection of qualified, efficient and skilled staff, the impact on the delivery of the benefits of investing in IT is not significant.

The Checklist Questions:

1. Has the training and up-skilling of the workforce led to the following benefits? Please rank the benefits in terms of importance. (1 more important...etc)

Benefits	**Yes**	**No**	**Rank**
Improve customer services	√		1
Raise the capacity to deal with the growth in number of transactions	√		2
Improve working conditions and competition	√		3
Improve the accounting control in terms of accuracy and recording transactions	√		4
Reduce the number of employees	√		6
Reduce a number of errors	√		5
Improve competitive advantage of the Bank	√		7

Appendix No 9: Interview (3): Commerce and development bank

I. General questions:

- The respondent's name and position?
  Idrees Al-Tashany, Manager of Accounting Management in Commerce and Development Bank
- How long is length of experience?
  30 years
- Highest level of education and qualifications.
  Bachelor of Business Administration

II. The extent and nature of AIS investment (RESEARCH QUESTION 1):

The Semi-structured interview questions:

1. Could you describe the nature and attributes of the accounting information systems in your bank?
   Since the opening of the bank in 1996, the management of the bank has aimed to use advanced technology in the banking business. The first system was designed by bank accountants and programmers. In 2004, the bank adopted an advanced foreign system called the MISYS system. Currently, all bank branches and agencies are connected by fibre optic network, and the bank uses mobile banking, ATMs and Visa cards. These developments have led to business being accurately and quickly. The bank uses computer technology in all business transactions.

2. How would you characterise your bank's use of Information Technology (IT)?
   Investment in IT is important and essential for the bank management and to obtain the latest innovations and devices in this area. IT provides new services to costumers and gives the bank a competitive advantage among other banks.

3. What are the types of the information generated by the accounting system in your bank?
   The accounting information system provides all required information. All external users can obtain financial statements. The Libyan central bank receives monthly and quarterly statistical reports. Regarding internal users, the system provides reports of business transactions for control and supervision and internal managerial reports. The information system provides required information to board members every day.

4. Could you let me know about the most important problems and obstacles that arise during the operation of the accounting information system and how you cope with them?
   The most important problems are just related to humane element in terms of data entry.
   The lack of efficient, qualified and skilled staff is the main problem in all Libyan banks.

5. Do you think the system is easy to use/ simple? Why? Why not?
   The system is easy and simple to use. It just needs training to follow the correct procedures.

6. In your bank, what are the main areas of business which IT projects have covered?
   All main areas of banking business in the bank have been covered by information technology projects. Only some simple transactions need to be manually entered at the beginning, such as documentary credits

The Checklist Questions:

1. Who are the users of the information generated by the accounting information system in your bank? Please rank the affirmative answers in order of frequency of use. (1 being the most frequent user...etc)

Users	Yes	No	Rank
Shareholders	√		4
Governmental bodies	√		6
Tax department in the finance ministry	√		7
Managers in your bank	√		2
Investors and creditors	√		5
Operatives, controllers, office staff	√		3
Bank top executives/Board members	√		1

III. The investment in AIS, business processes and business performance (RQ2):

The Semi-structured interview questions:

1. How would you assess the effectiveness and the efficiency of the accounting information system in your bank?
   The accounting information system is excellent and there are no any obstacles that keep the AIS from being more effective. Obtained benefits from the system are greater than its cost. It ensures the quality of the data, provides information to internal users constantly and to external users monthly and quarterly.

2. How does investment in information technology influence on the bank's reputation?
   There is a positive influence on the bank's reputation for faster and easer business transactions to be easier and faster. It also strengthens its competitiveness among other banks.

3. In your opinion, to what extent are the current accounting systems effective in supporting managers in decision-making and problem solving? Please give examples as appropriate.
   The system is effective to the maximum extent in support of decision making, especially after using the new system and the connectivity between bank branches and agencies.

4. In your opinion, to what extent is there a need to develop the accounting information system in response to the development and changes in the Libyan business environment? (e.g. NPS)
   The system is compatible with the changes and developments in the Libyan business environment, except some technical matters which the bank is dealing with it now.

5. What role has information technology played in response to the competition that your bank has faced?
   IT is playing the major role in response to the competition that the bank has faced. The current bank's reputation was caused by using advanced information technology.

6. In your opinion, how does the accounting information system in your bank develop business performance?
   The level of accounting information system in the bank is sufficient to improve business performance. The system has simplified transaction, reduced costs and time and supported decision-making.

7. What is the effect of the upgrade in IS /IT infrastructure on the structure of the workforce and activities in your bank?
   The upgrade in IS/IT infrastructure has improved employees performance and banking business performance and provided new services to the customers

8. How has the upgrade of IS/IT infrastructure impacted on banking transaction costs and the number of staff / branches? Please explain.
   The upgrade in IS/IT infrastructure has led to a decrease in the number of staff and the cost of transactions. However, upgrade of IS/IT infrastructure has no impact on the number of branches due to the large area of the country.

The Checklist Questions:

1. From the list below, what are the factors driving investments in Information Technology in your bank? Please rank the affirmative factors in order of importance. (1 most important…etc).

Factors	Yes	No	Rank
Create overall market growth (create new demands)	√		8
Market share growth (take from competition)	√		7
Defend current market share position	√		6
Improve and increase customer services	√		1
Cut service prices/lower service costs	√		5
Increase internal efficiency	√		2
Increase understanding of customer needs	√		3
Increase efficiency of business transactions	√		4

2. Which of the following factors contribute to the success of your information technology bank? Please rank the contributors in order of importance. (1 most contributory...etc)

Contributors	Yes	No	Rank
Technical skills of information system staff members	√		1
Alignment of information system and business strategies	√		2
Customer service attitude towards information systems	√		6
Supportive bank management/users	√		3
Partnering with external service provider(s)	√		5
Adequate funding	√		4
Reduce cost and errors	√		8
Provide quality and innovation services to the customer	√		7

3. Please respond to the statements below using Yes or No and rank affirmative answers in order of importance. (1 more important...etc)

Statements	Yes	No	Rank
Information technology enables your bank to increase revenues	√		4
Information technology provides a way for your bank to reduce costs	√		5
Information technology gives your bank competitive advantage	√		1
Information technology assists and supports the needs of your bank's business	√		2
Information technology is an important component and is aligned to your business strategy	√		3
Information technology plays an integral role in meeting customer requirements	√		6

4. Does your bank make the following items available to implement, support and develop accounting information systems? Please rank the affirmative items in terms of their availability. (1 more available...etc).

Items	Yes	No	Rank
Enough funds for on-going investment in AIS	√		1
Technical tools to develop and support AIS	√		2
Outside specialist experts when required	√		4
Skilled personal to implement and support the AIS	√		3

5. Do you agree that the following benefits of the information technology banking services are evidenced by your bank? Pleas rank the evidenced benefits in terms of your agreement. (1 more important…etc).

Benefits	Yes	No	Rank
It is easy to use IT banking services	√		4
IT banking services save your time	√		1
IT banking services make your banking more convenient	√		5
IT banking services provide privacy in your banking transaction	√		2
IT banking services provide accurate account information	√		3

IV. The importance of training and up-skilling of the workforce (RQ3)

1. In general, could you assess the training and up-skilling of the workforce programmes and policies related to AIS in your bank?
   There are no clear policies or plans for training and up-skilling in the bank. Employees were trained for new system by the management of information technology. There is now training courses for new employees. However, the employees are satisfied with the new system.

2. What is the role that employees play in improving the AIS?
   During the operation of the system by the employees, they have a role to improve the system by submitting their suggestions to the management.

3. To what extent do you think the training and up-skilling of the workforce is needed to realise the benefits of AIS adequately/satisfactorily?
   The training and up-skilling is very necessary for employees to accomplish the benefits of AIS.
4. In general, to what extent do you think employees' skills in IT can help to improve business performance?
   The employees' skills in IT improve business performance. The employees' skills influence positively on business performance. This performance influences through the improvement of service and speed up transactions and reduce errors.

5. In your opinion what are the effects of training and up-skilling the workforce on the delivery of the benefits of investing in IT in your bank?
   Because of there are no policies and plans for training and up-skilling the workforce, so the impacts of the training and up-skilling is not significant.

The Checklist Questions:

1. Has the training and up-skilling of the workforce led to the following benefits? Please rank the benefits in terms of importance. (1 more important...etc)

Benefits	Yes	No	Rank
Improve customer services	√		1
Raise the capacity to deal with the growth in number of transactions	√		2
Improve working conditions and competition	√		7
Improve the accounting control in terms of accuracy and recording transactions	√		3
Reduce the number of employees	√		6
Reduce a number of errors	√		5
Improve competitive advantage of the Bank	√		4

Appendix No 10: Interview (4): Commerce and development bank

I. General questions:

- The respondent's name and position?
  Mohammed Al-Jhany, Manager of Operations Management in the Commerce and Development Bank
- How long is length of experience?
  35 years
- Highest level of education and qualifications.
  Bachelor of Accounting

II. The extent and nature of AIS investment (RESEARCH QUESTION 1):

The Semi-structured interview questions:

1. Could you describe the nature and attributes of the accounting information systems in your bank?
   The Commerce and Development Bank is the first and largest privet bank in Libya. It is also the first Libyan bank has connected all its branches and agencies by a single banking system through fibre optic network and satellite connectivity. The bank has used the system since the establishment of the bank in 1996. The bank has continued to develop it and used an advanced technology. Currently, the bank uses an advanced system designed by a global company. This system is very advanced and enabled the management to obtain any required information about any branch at any time. All activities of the bank depend entirely on the using of computer.

2. How would you characterise your bank's use of Information Technology (IT)?
   The policy of the bank's management is convoying and benefiting from the development in technology to develop the system. Thus, the information technology is a critical and essential investment area for the management. This investment led to increasing customers' number and providing new services. Moreover, the bank is distinguished from other banks by using advanced technology.

3. What are the types of the information generated by the accounting system in your bank?
   The accounting information system provides huge number of data and information for external and internal users on time such as financial statements and daily activities reports. Everyday, reports and statistics activities are provided to the senior management and board members for making-decision.

4. Could you let me know about the most important problems and obstacles that arise during the operation of the accounting information system and how you cope with them?
   The problem is the system is very advanced with a lack in training on the system, which resulted in a lack of maximum utilisation of capabilities of the system. This problem is resulted from there is no branch of the company that designed the system in Libya; therefore the staff has not trained on the system well by the company.
5. Do you think the system is easy to use/ simple? Why? Why not?
   The system is not easy, and needs time and training to be easy for use at the best use.

6. In your bank, what are the main areas of business which IT projects have covered?
   All banking business activities in the bank have been covered by information technology projects.

The Checklist Questions:

1. Who are the users of the information generated by the accounting information system in your bank? Please rank the affirmative answers in order of frequency of use. (1 being the most frequent user...etc)

Users	Yes	No	Rank
Shareholders	√		3
Governmental bodies	√		7
Tax department in the finance ministry	√		5
Managers in your bank	√		2
Investors and creditors	√		4
Operatives, controllers, office staff	√		6
Bank top executives/Board members	√		1

III. The investment in AIS, business processes and business performance (RQ2):

The Semi-structured interview questions:

1. How would you assess the effectiveness and the efficiency of the accounting information system in your bank?
   The system is efficient and effective in term of providing required information in time and it is advanced. Although, the cost of the system is high but there are great benefits obtained by using the system. It saves time and effort and ensures the quality of data and provides information to all users.

2. How does investment in information technology influence on the bank's reputation?
   Using of information technology banking business has a positive impact on the bank's reputation. The using of information technology and the connection between the head office and branches enabled customers to conduct their banking transactions in any branch, and providing required information to support management to make right decisions. In addition, the using of information technology creates new services and increases number of customers. These lead to increasing of income. Subsequently, gains distributions will be increased, these will influence on the bank's market value.

3. In your opinion, to what extent are the current accounting systems effective in supporting managers in decision-making and problems solving? Please give examples as appropriate.
   The advantage of the system is to obtain accurate and timely information about any business activities of the bank; this led to the decision-making is fast and accurate.
   For example, every day a report about activities of each branch is prepared comparatively with a report of the previous day and transferring it to the senior management.

4. In your opinion, to what extent is there a need to develop the accounting information system in response to the development and changes in the Libyan business environment? (e.g. NPS)
   The NPS is efficient and advanced system. On the other hand, because of the completion of connectivity of all bank branches and agencies, the bank is ready to deal with the NPS just we are waiting other banks to complete connecting their branches with a single system.

5. What role has information technology played in response to the competition that your bank has faced?
   Whenever the bank uses the advanced technology in the banking business thus provides new and fast services, this led to increasing of customers number and thereby increasing of bank's revenues. The bank relies on information technology in competition with other banks.
6. In your opinion, how does the accounting information system in your bank develop business performance?
   The system is good and sufficient to develop business performance because it results in speed of services delivery and providing of information on time as well as reducing of procedures.

7. What is the effect of the upgrade in IS /IT infrastructure on the structure of the workforce and activities in your bank?
   The upgrade in IS/IT infrastructure has led to reduced a number and cost of transactions created a new banking activities.

8. How has the upgrade of IS/IT infrastructure impacted on banking transaction costs and the number of staff / branches? Please explain.
   Whenever the system is developed, the number of staff and the number of transactions are decreased. Moreover whenever the reputation of bank is good, the demand of bank's services is increased by customers, this leads to increase a number of branches.

The Checklist Questions:

1. From the list below, what are the factors driving investments in Information Technology in your bank? Please rank the affirmative factors in order of importance. (1 most important…etc).

Factors	Yes	No	Rank
Create overall market growth (create new demands)	√		4
Market share growth (take from competition)	√		3
Defend current market share position		√	
Improve and increase customer services	√		1
Cut service prices/lower service costs	√		2
Increase internal efficiency		√	
Increase understanding of customer needs		√	
Increase efficiency of business transactions	√		5

2. Which of the following factors contribute to the success of your information technology bank? Please rank the contributors in order of importance. (1 most contributory...etc)

Contributors	Yes	No	Rank
Technical skills of information system staff members	√		1
Alignment of information system and business strategies	√		3
Customer service attitude towards information systems		√	
Supportive bank management/users	√		2
Partnering with external service provider(s)		√	
Adequate funding	√		4
Reduce cost and errors		√	
Provide quality and innovation services to the customer		√	

3. Please respond to the statements below using Yes or No and rank affirmative answers in order of importance. (1 more important...etc)

Statements	Yes	No	Rank
Information technology enables your bank to increase revenues	√		3
Information technology provides a way for your bank to reduce costs	√		2
Information technology gives your bank competitive advantage	√		1
Information technology assists and supports the needs of your bank's business	√		4
Information technology is an important component and is aligned to your business strategy	√		5
Information technology plays an integral role in meeting customer requirements	√		6

4. Does your bank make the following items available to implement, support and develop accounting information systems? Please rank the affirmative items in terms of their availability. (1 more available...etc).

Items	Yes	No	Rank
Enough funds for on-going investment in AIS	√		1
Technical tools to develop and support AIS	√		2
Outside specialist experts when required	√		4
Skilled personal to implement and support the AIS	√		3

5. Do you agree that the following benefits of the information technology banking services are evidenced by your bank? Pleas rank the evidenced benefits in terms of your agreement. (1 more important…etc).

Benefits	Yes	No	Rank
It is easy to use IT banking services	√		5
IT banking services save your time	√		2
IT banking services make your banking more convenient	√		4
IT banking services provide privacy in your banking transaction	√		3
IT banking services provide accurate account information	√		1

IV. The importance of training and up-skilling of the workforce (RQ3)

1. In general, could you assess the training and up-skilling of the workforce programmes and policies related to AIS in your bank?

   There is just internal training that is organised by the management of information technology in the bank. However, external training is required to improve workforce performance and banking business performance.

   The employees are satisfied with the new system but they need more training on the system to get its benefits as much as possible.

2. What is the role that employees play in improving the AIS?

   The management of information technology receives any suggestion from operators of the system, and then the management call on the company that designed the system if there is any modification or development.

3. To what extent do you think the training and up-skilling of the workforce is needed to realise the benefits of AIS adequately/satisfactorily?
   The training and up-skilling is very required to accomplish the benefits of accounting information system adequately and satisfactorily.

4. In general, to what extent do you think employees' skills in IT can help to improve business performance?
   Skilled employee in IT is very helpful to improve business performance.

5. In your opinion what are the effects of training and up-skilling the workforce on the delivery of the benefits of investing in IT in your bank?
   The training and up-skilling the workforce has a positive impact on the delivery of the benefits of investing in IT in terms of accuracy of work and completion speed of transactions.

The Checklist Questions:

1. Has the training and up-skilling of the workforce led to the following benefits? Please rank the benefits in terms of importance. (1 more important...etc)

Benefits	Yes	No	Rank
Improve customer services	√		1
Raise the capacity to deal with the growth in number of transactions	√		5
Improve working conditions and competition	√		7
Improve the accounting control in terms of accuracy and recording transactions	√		2
Reduce the number of employees	√		4
Reduce a number of errors	√		3
Improve competitive advantage of the Bank	√		6

Appendix No 11: Interview (5): Commerce and development bank

I. General questions:

- The respondent's name and position?
  Ahmed Zaid, Manager of Information Technology Department in Commerce and Development Bank
- How long is length of experience?
  3 years
- Highest level of education and qualifications.
  Bachelor of Computer Science

II. The extent and nature of AIS investment (RESEARCH QUESTION 1):

The Semi-structured interview questions:

1. Could you describe the nature and attributes of the accounting information systems in your bank?
   Since the establishment of the bank in 1996 until 2004, accounting information systems which were used in the bank were designed by local companies. The system was limited capacities. Since that period the management was focused on the development of customer service in a new way from what was common in other Libyan banks. As the local systems did not meet ambitions of the bank, the management tend to global systems. In 2004 until now, the bank has used a global accounting information system which is called MISYS system. The bank has spent vast sums on information technology infrastructure, which began to benefit the bank. In addition, there are secondary systems such as electronic banking system and mobile banking system, which were designed by local companies. The bank depends entirely on the computer in banking business.

2. How would you characterise your bank's use of Information Technology (IT)?
   The bank is the first in terms of using information technology in customer services such as Visa cards, ATMs, point of sale, mobile banking and Western Union. The bank has also contributed to encourage the use of technology in Libya. The bank views IT as a critical and essential investment area and uses it as a competitive weapon with other banks.

3. What are the types of the information generated by the accounting system in your bank?
   The system provides a daily report to the senior management about all banking activities. It also provides required information to deferent managerial levels to help make the right decisions in time, and provides necessary information to external users.

4. Could you let me know about the most important problems and obstacles that arise during the operation of the accounting information system and how you cope with them?
   The most important problems are related to a lack of a communications infrastructure in the country. There are some problems in operation, maintenance and support the system, which are resulted from insufficient the training and up-skilling the workforce. These problems face all Libyan banks.

5. Do you think the system is easy to use/ simple? Why? Why not?
   The system is easy and simple to use. However, it is difficult in terms of support and maintenance as a result the system is very developed and requires highly qualified and skilled staff.
6. In your bank, what are the main areas of business which IT projects have covered?
   All banking business activities have been covered by information technology projects.

The Checklist Questions:

1. Who are the users of the information generated by the accounting information system in your bank? Please rank the affirmative answers in order of frequency of use. (1 being the most frequent user...etc)

Users	Yes	No	Rank
Shareholders	√		4
Governmental bodies	√		7
Tax department in the finance ministry	√		6
Managers in your bank	√		2
Investors and creditors	√		5
Operatives, controllers, office staff	√		3
Bank top executives/Board members	√		1

III. About the investment in AIS, business processes and business performance (RQ2):

The Semi-structured interview questions:

1. How would you assess the effectiveness and the efficiency of the accounting information system in your bank?
   The system is efficient and effective especially in the long term. It ensures the quality of data and provides information easily to all users. The advantage of the system is that it accommodates any new activities. The obstacles that keep the bank from having an effective accounting information system are a lack of culture of customers to use technological services that is resulted there is no good services marketing by the bank for these services, and the system is very huge and the management has tried to use it the better use but the obstacle is a lack of training and up-skilling the workforce.

2. How does investment in information technology influence on the bank's reputation?
   Providing a technological and new service to the customer has led to an increase reputation of the bank.

3. In your opinion, to what extent are the current accounting systems effective in supporting managers in decision-making and problems solving? Please give examples as appropriate.
   The system is very effective in supporting managers because the main target of design of the system is supporting and improving decision-making.

4. In your opinion, to what extent is there a need to develop the accounting information system in response to the development and changes in the Libyan business environment? (e.g. NPS)
   The case now is the opposite comparing with other Libyan banks. They need to develop their accounting information system. We are ready now; just we are waiting other banks to connect with them through NPS.

5. What role has information technology played in response to the competition that your bank has faced?
   Information technology provides new services to the customers, thus plies a key role in the competition. As the most services are similar in all Libyan banks but ways of providing these services are different result of the using of information technology.

6. In your opinion, how does the accounting information system in your bank develop business performance?
   Accounting information system has developed business performance of the bank by providing new services and improving existing services.
   Currently the system is sufficient to improve performance; at the same time the development is ongoing to improve business performance.

7. What is the effect of the upgrade in IS /IT infrastructure on the structure of the workforce and activities in your bank?
   Currently the most bank transaction done automatically. The upgrade in IS/IT infrastructure has provided new services, increased accuracy of information, and reduced time to complete transactions and reduced errors. It has a positive effect on increase and improvement of services and creation new activities.

8. How has the upgrade of IS/IT infrastructure impacted on banking transaction costs and the number of staff / branches? Please explain.
   The upgrade in IS/IT infrastructure has led to a decrease in the cost of banking transactions and the number of staff. Increase the number of branches based on a feasibility study and not related to information technology projects.

The Checklist Questions:

1. From the list below, what are the factors driving investments in Information Technology in your bank? Please rank the affirmative factors in order of importance. (1 most important…etc).

Factors	Yes	No	Rank
Create overall market growth (create new demands)	√		8
Market share growth (take from competition)	√		5
Defend current market share position	√		4
Improve and increase customer services	√		1
Cut service prices/lower service costs	√		2
Increase internal efficiency	√		3
Increase understanding of customer needs	√		6
Increase efficiency of business transactions	√		7

2. Which of the following factors contribute to the success of your information technology bank? Please rank the contributors in order of importance. (1 most contributory...etc)

Contributors	Yes	No	Rank
Technical skills of information system staff members	√		5
Alignment of information system and business strategies	√		8
Customer service attitude towards information systems	√		7
Supportive bank management/users	√		4
Partnering with external service provider(s)	√		6
Adequate funding	√		3
Reduce cost and errors	√		2
Provide quality and innovation services to the customer	√		1

3. Please respond to the statements below using Yes or No and rank affirmative answers in order of importance. (1 more important...etc)

Statements	Yes	No	Rank
Information technology enables your bank to increase revenues	√		2
Information technology provides a way for your bank to reduce costs	√		3
Information technology gives your bank competitive advantage	√		1
Information technology assists and supports the needs of your bank's business	√		5
Information technology is an important component and is aligned to your business strategy	√		6
Information technology plays an integral role in meeting customer requirements	√		4

4. Does your bank make the following items available to implement, support and develop accounting information systems? Please rank the affirmative items in terms of their availability. (1 more available...etc).

Items	Yes	No	Rank
Enough funds for on-going investment in AIS	√		1
Technical tools to develop and support AIS	√		2
Outside specialist experts when required	√		3
Skilled personal to implement and support the AIS	√		4

5. Do you agree that the following benefits of the information technology banking services are evidenced by your bank? Pleas rank the evidenced benefits in terms of your agreement. (1 more important…etc).

Benefits	Yes	No	Rank
It is easy to use IT banking services	√		5
IT banking services save your time	√		1
IT banking services make your banking more convenient	√		3
IT banking services provide privacy in your banking transaction	√		4
IT banking services provide accurate account information	√		2

IV. The importance of training and up-skilling of the workforce (RQ3)

1. In general, could you assess the training and up-skilling of the workforce programmes and policies related to AIS in your bank?

   There is no clear policy for training in the bank. Recently a training centre was established in the bank. At the beginning of use the new system the employees were trained by the MISYS Company, which designed the system. However, this training for new employees or up-skilling for the existing employees did not continue. There are undertaken courses by the VISA Company. The bank management nominates staff to attend these courses. In general the employees are satisfied with the new system.

2. What is the role that employees play in improving the AIS?

   Rarely there are some exceptional employees who have submitted suggestions and implemented.

3. To what extent do you think the training and up-skilling of the workforce is needed to realise the benefits of AIS adequately/satisfactorily?

   The human element is essentially and very important to operate the system, so the training and up-skilling the workforce is necessary to realise the benefits of AIS adequately and satisfactorily.

4. In general, to what extent do you think employees' skills in IT can help to improve business performance?

   Employee's skills in information technology improve business performance through saving time and effort, it also improves the services.

5. In your opinion what are the effects of training and up-skilling the workforce on the delivery of the benefits of investing in IT in your bank?

   When the employees have been training and up-skilling well, they can create new services and has impact on the business performance.

   The linkage between the branches of the bank and mobile banking were resulted from the training.

The Checklist Questions:

1. Has the training and up-skilling of the workforce led to the following benefits? Please rank the benefits in terms of importance. (1 more important...etc)

Benefits	Yes	No	Rank
Improve customer services	√		2
Raise the capacity to deal with the growth in number of transactions	√		3
Improve working conditions and competition	√		6
Improve the accounting control in terms of accuracy and recording transactions	√		4
Reduce the number of employees	√		7
Reduce a number of errors	√		1
Improve competitive advantage of the Bank	√		5

Appendix No 12: Interview (6): Wahda bank

I. General questions:

- The respondent's name and position
  Khaled Alshekhi, Manager of Applications in Wahda Bank
- How long is length of experience?
  19 years
- Highest level of education and qualifications.
  Bachelor of Computer Science

II. The extent and nature of AIS investment (RESEARCH QUESTION 1):

The Semi-structured interview questions:

1. Could you describe the nature and attributes of the accounting information systems in your bank?

   The accounting information system exists from the establishment of the bank in 1970. In the early of nineties, as a result of the increasing number of accounts and the diversity of banking services technology and modern programming in AIS were used. Now the bank adopts an integrated and developed banking system. This system includes all banking services, which is called FLEXCUBE. The bank recently received advanced equipment and installed a central database. The branches are now linked to fibre-optic network and satellite.

   This technological evolution in the banking, based on a comprehensive plan (NPS) under the auspices of Central Bank of Libya in partnership with five banks, whish is Wahda Bank, Gumhouria Bank, National Commercial Bank, Sahara Bank and National Banking Corporation. Of the objectives of the system are providing of sophisticated banking products to customers, introduce new banking products in shortest time and improve efficiency in banking business performance.

   There is a full use of the computer in banking business and a completely dependence on information technology.

2. How would you characterise your bank's use of Information Technology (IT)?

   The bank always keeps pace with developments in technology to improve business performance.

   It aims to actively participate in NPS project, starting the integrated banking system and communication networks. The new system is applied in number of branches. The ATMs and mobile banking are used and there is incredible interest from customers for these services.

   Now the bank is applying the most advanced technology regarding banking business.

3. What are the types of the information generated by the accounting system in your bank?

   The accounting information system provides the information needed by managers in decision-making. Moreover, it provides a significant amount of required reports and statistics about all branches easily and on time.

4. Could you let me know about the most important problems and obstacles that arise during the operation of the accounting information system and how you cope with them?

   The most important problem that arise during the operation of the system is communication, occurs weakness or disconnection in communications. The main services of the system depend on the communications. This disconnection impacts on timely information. The second

problem is there is no qualified human element to operate and support this advanced system. The workforce needs training and up-skilling in core banking, security system and communications.

The third problem is that In Libya; there are no specialists in support and maintenance of advanced systems as well as in communications.

These problems are facing all Libyan banks due to a lack of expertise in modern technology and communications.

5. Do you think the system is easy to use/ simple? Why? Why not?

The new system is easy to use but this system needs to work 24 hours in 7 days and the staff is not accustomed with shift work.

6. In your bank, what are the main areas of business which IT projects have covered?

All services that are provided by the bank have been covered by the information technology projects.

The Checklist Questions:

1. Who are the users of the information generated by the accounting information system in your bank? Please rank the affirmative answers in order of frequency of use. (1 being the most frequent user...etc)

Users	Yes	No	Rank
Shareholders	√		5
Governmental bodies	√		7
Tax department in the finance ministry	√		6
Managers in your bank	√		2
Investors and creditors	√		4
Operatives, controllers, office staff	√		1
Bank top executives/Board members	√		3

III. The investment in AIS, business processes and business performance (RQ2):

The Semi-structured interview questions:

1. How would you assess the effectiveness and the efficiency of the accounting information system in your bank?

The projects management in the bank use scientific methods to study projects. The system is effective, efficient and very sophisticated. It provides necessary information on time and saves time and effort. The bank's performance improved significantly after using the new system. For example, this reflected on increase a proportion of debt collection.

The obstacle that keeps the bank from being more effective system is training the staff on the new system because of the large number of staff., who all are needed to training on the system.

2. How does investment in information technology influence the bank's reputation?

The using of information technology has a significant effect on the bank's reputation. For example, when the mobile banking was used there was incredible interest from customers for this service.

3. In your opinion, to what extent are the current accounting systems effective in supporting managers in decision-making and problem solving? Please give examples as appropriate.

The system provides a huge number of reports and statistics to support decision-making. However, the problem is how to benefit from these reports and statistics? The management still relies on some traditional reports. In order to achieve a maximum benefit from the system, and this achievement comes from training and up-skilling the workforce. The bank now does not use more than 10% of capability of the system.

4. In your opinion, to what extent is there a need to develop the accounting information system in response to the development and changes in the Libyan business environment? (e.g. NPS)

There is an urgent need to develop the AIS for providing a new services and meet customer requirements.

5. What role has information technology played in response to the competition that your bank has faced?

Due to the openness of the Libyan banks for foreign banks, the Central Bank of Libya led Libyan banks to develop banking technology and service development, where it adopted the NPS strategy to enable Libyan banks to compete with foreign banks to provide same services at same level.

6. In your opinion, how does the accounting information system in your bank develop business performance?

The bank is focusing on completing the core banking system. The next stage will be using the data mining and data warehouse to develop business performance and support decision-making. This stage has not yet begun in the Libyan banks.

The level of accounting information system is now sufficient but after using of the data mining and data warehouse with skilled staff will be there the best use of the information technology.

7. What is the effect of the upgrade in IS /IT infrastructure on the structure of the workforce and activities in your bank?

The upgrade in IS/IT infrastructure has a positive impact on the structure of the workforce and activities in the bank. It reduced time to accomplish transactions and provided new areas for banking activities.

8. How has the upgrade of IS/IT infrastructure impacted on banking transaction costs and the number of staff / branches? Please explain.

The upgrade in IS/IT infrastructure does not mean reducing the number of staff because the technology needs operators and supporters 24 hours in 7 days. The upgrade in IS/IT infrastructure also has led to increase cost of the most banking transactions. However it has had no impact on the number of branches.

The Checklist Questions:

1. From the list below, what are the factors driving investments in Information Technology in your bank? Please rank the affirmative factors in order of importance. (1 most important…etc).

Factors	Yes	No	Rank
Create overall market growth (create new demands)	√		4
Market share growth (take from competition)	√		5
Defend current market share position	√		6
Improve and increase customer services	√		3
Cut service prices/lower service costs		√	
Increase internal efficiency	√		2
Increase understanding of customer needs	√		1
Increase efficiency of business transactions	√		7

2. Which of the following factors contribute to the success of your information technology bank? Please rank the contributors in order of importance. (1 most contributory...etc)

Contributors	Yes	No	Rank
Technical skills of information system staff members	√		2
Alignment of information system and business strategies	√		3
Customer service attitude towards information systems	√		7
Supportive bank management/users	√		1
Partnering with external service provider(s)	√		4
Adequate funding	√		6
Reduce cost and errors		√	
Provide quality and innovation services to the customer	√		5

3. Please respond to the statements below using Yes or No and rank affirmative answers in order of importance. (1 more important...etc)

Statements	Yes	No	Rank
Information technology enables your bank to increase revenues	√		1
Information technology provides a way for your bank to reduce costs	√		2
Information technology gives your bank competitive advantage	√		3
Information technology assists and supports the needs of your bank's business	√		4
Information technology is an important component and is aligned to your business strategy	√		5
Information technology plays an integral role in meeting customer requirements	√		6

4. Does your bank make the following items available to implement, support and develop accounting information systems? Please rank the affirmative items in terms of their availability. (1 more available...etc).

Items	Yes	No	Rank
Enough funds for on-going investment in AIS	√		2
Technical tools to develop and support AIS	√		1
Outside specialist experts when required	√		3
Skilled personal to implement and support the AIS	√		4

5. Do you agree that the following benefits of the information technology banking services are evidenced by your bank? Pleas rank the evidenced benefits in terms of your agreement. (1 more important…etc).

Benefits	Yes	No	Rank
It is easy to use IT banking services	√		5
IT banking services save your time	√		1
IT banking services make your banking more convenient	√		2
IT banking services provide privacy in your banking transaction	√		4
IT banking services provide accurate account information	√		3

IV. The importance of training and up-skilling of the workforce (RQ3)

1. In general, could you assess the training and up-skilling of the workforce programmes and policies related to AIS in your bank?
   There is a lack in training programs in the IT and up-skilling area in the bank, but now management for training has been established and there are training programmes with the central bank of Libya. All bank's employees have had computer courses.
   Regarding the new system the bank has a policy of training of trainers. The trainers were trained outside the bank by the company that designed the systems, and the employees have had training by the trainers inside the bank.
   At the beginning of using of the new system there was resistance by the employees because the work system has had dramatically changed. However, after touching the results of the system there is satisfaction and contentment with it.

2. What is the role that employees play in improving the AIS?
   There is a special committee to study the proposals submitted by employees to improve the system and adoption the appropriate of them.

3. To what extent do you think the training and up-skilling of the workforce is needed to realise the benefits of AIS adequately/satisfactorily?
   The training and up-skilling is very important to realise the benefits of AIS, because with out training can not achieve its benefits adequately and satisfactorily.

4. In general, to what extent do you think employees' skills in IT can help to improve business performance?
   Employees' skills in IT are very important to improve business performance through using the capabilities of the system better use. However, the bank suffers from a lack of qualified and skilled staff.

5. In your opinion what are the effects of training and up-skilling the workforce on the delivery of the benefits of investing in IT in your bank?
   Training and up-skilling now is weak comparing with the high level of available technology, because it needs high skills and training in operation and security to use the capabilities of the developed system optimum use.

The Checklist Questions:

1. Has the training and up-skilling of the workforce led to the following benefits? Please rank the benefits in terms of importance. (1 more important...etc)

Benefits	Yes	No	Rank
Improve customer services		√	
Raise the capacity to deal with the growth in number of transactions		√	
Improve working conditions and competition		√	
Improve the accounting control in terms of accuracy and recording transactions	√		1
Reduce the number of employees		√	
Reduce a number of errors		√	
Improve competitive advantage of the Bank		√	

Appendix No 13: Interview (7): Wahda bank

I. General questions:

- The respondent's name and position

Ahmed Rashid, Manager of Accounting Management in Wahda Bank

- How long is length of experience?

37 years

- Highest level of education and qualifications.

Bachelor of Accounting

II. The extent and nature of AIS investment (RESEARCH QUESTION 1):

The Semi-structured interview questions:

1. Could you describe the nature and attributes of the accounting information systems in your bank?

   At the beginning of the establishment of the bank in 1970, the accounting information system was manual and different from one branch to another. These led to delays in the information and prepare budgets and reports. In the early eighties the bank began to use the computer in the banking business .At the end of the nineties the bank has used two domestic systems but these systems still inadequate to keep pace with technical developments in banking business.

   The strategic plan of the bank now is participation with Central Bank of Libya in the NPS project. This project needs development technology, thus the bank has started to use advanced system that is FLEXCUBE. There is a full use of the computer in accounting information system.

2. How would you characterise your bank's use of Information Technology (IT)?

   Due to the installation of the new system had not been completed in all branches there is still a lack of use of information technology.

   Regarding the viewing information technology as a competitive weapon, it is linked to the infrastructure and communications in country as well as with central bank of Libya as the bank linked with it by NPS. The private banks have taken a competitive advantage in information technology because they are small and modern.

3. What are the types of the information generated by the accounting system in your bank?

   The accounting information system provides managerial reports, budgets and statistics that include required information to all internal and external users such as governmental bodies, tax department, managers of bank, board members and senior management.

4. Could you let me know about the most important problems and obstacles that arise during the operation of the accounting information system and how you cope with them?

   The important problems are communication and transferring from old system to the new system. Although there is a management to support the system, but there is a lack of expertise. For example, there are reports can not be obtained, although it is present in the system, thus this problem affects on the availability of information on time.

5. Do you think the system is easy to use/ simple? Why? Why not?

   The new system is easy to use because information can be obtained easily but it needs training the employees.

6. In your bank, what are the main areas of business which IT projects have covered?
   Documentary credits and assessment of the currency

The Checklist Questions:

1. Who are the users of the information generated by the accounting information system in your bank? Please rank the affirmative answers in order of frequency of use. (1 being the most frequent user...etc)

Users	Yes	No	Rank
Shareholders	√		2
Governmental bodies	√		3
Tax department in the finance ministry	√		4
Managers in your bank	√		5
Investors and creditors	√		6
Operatives, controllers, office staff	√		7
Bank top executives/Board members	√		1

III. The investment in AIS, business processes and business performance (RQ2):

The Semi-structured interview questions:

1. How would you assess the effectiveness and the efficiency of the accounting information system in your bank?
   Because the central bank of Libya bears a large part of the cost of system, so the benefits great comparing with its cost. The important factor that influences the efficiency of the development of AIS is the speed of providing information to all users easily and accurately. On the other hand the obstacles that keep the bank from being more effective system are a lack training and skilled staff.

2. How does investment in information technology influence the bank's reputation?
   The investment in information technology affects on the bank's reputation. For example, speed of completion of the transactions and using mobile banking.

3. In your opinion, to what extent are the current accounting systems effective in supporting managers in decision-making and problem solving? Please give examples as appropriate.
   The system is effective in supporting managers in decision-making and problem solving.
   When the information is obtained timely and accurate the investment decision will be right and on time, opportunity cost will be reduced through and determining interest rate at any time by obtaining the cost of money.

4. In your opinion, to what extent is there a need to develop the accounting information system in response to the development and changes in the Libyan business environment? (e.g. NPS)
   Due to development in the Libyan business environment the bank has changed its system in line with this development especially with the NPS project.

5. What role has information technology played in response to the competition that your bank has faced?
   The Role of information technology in the competition is that it enabled the bank to use new products such as the use of electronic cards to keep up with the competition, maintaining existing customers and obtaining new customers and completion rapid of services

6. In your opinion, how does the accounting information system in your bank develop business performance?
   The accounting information system develops the business performance by providing new banking activities thus it will increase bank's profits. However, the level of accounting information system is not sufficient enough to improve business performance. It can be improved by training and up-skilling the employees for new system and develop the infrastructure of communications.

7. What is the effect of the upgrade in IS /IT infrastructure on the structure of the workforce and activities in your bank?
   The upgrade in IS/IT infrastructure will provide new banking products and activities of bank will be increased and activities of the bank will be expanded as will.

8. How has the upgrade of IS/IT infrastructure impacted on banking transaction costs and the number of staff / branches? Please explain.
   The upgrade in IS/IT infrastructure has increased cost of transaction and number of staff will be decreased. However it has not relationship with number of branches because it depends on capital of the bank.

The Checklist Questions:

1. From the list below, what are the factors driving investments in Information Technology in your bank? Please rank the affirmative factors in order of importance. (1 most important…etc).

Factors	Yes	No	Rank
Create overall market growth (create new demands)	√		7
Market share growth (take from competition)	√		4
Defend current market share position	√		8
Improve and increase customer services	√		2
Cut service prices/lower service costs	√		3
Increase internal efficiency	√		1
Increase understanding of customer needs	√		6
Increase efficiency of business transactions	√		7

6. Which of the following factors contribute to the success of your information technology bank? Please rank the contributors in order of importance. (1 most contributory...etc)

Contributors	Yes	No	Rank
Technical skills of information system staff members	√		7
Alignment of information system and business strategies		√	
Customer service attitude towards information systems		√	
Supportive bank management/users	√		4
Partnering with external service provider(s)	√		5
Adequate funding	√		6
Reduce cost and errors	√		1
Provide quality and innovation services to the customer	√		2

7. Please respond to the statements below using Yes or No and rank affirmative answers in order of importance. (1 more important...etc)

Statements	Yes	No	Rank
Information technology enables your bank to increase revenues	√		6
Information technology provides a way for your bank to reduce costs	√		1
Information technology gives your bank competitive advantage	√		2
Information technology assists and supports the needs of your bank's business	√		3
Information technology is an important component and is aligned to your business strategy	√		5
Information technology plays an integral role in meeting customer requirements	√		4

8. Does your bank make the following items available to implement, support and develop accounting information systems? Please rank the affirmative items in terms of their availability. (1 more available...etc).

Items	Yes	No	Rank
Enough funds for on-going investment in AIS	√		1
Technical tools to develop and support AIS	√		3
Outside specialist experts when required	√		2
Skilled personal to implement and support the AIS	√		4

9. Do you agree that the following benefits of the information technology banking services are evidenced by your bank? Pleas rank the evidenced benefits in terms of your agreement. (1 more important…etc).

Benefits	Yes	No	Rank
It is easy to use IT banking services	√		1
IT banking services save your time	√		2
IT banking services make your banking more convenient	√		3
IT banking services provide privacy in your banking transaction	√		5
IT banking services provide accurate account information	√		4

IV. The importance of training and up-skilling of the workforce (RQ3)

1. In general, could you assess the training and up-skilling of the workforce programmes and policies related to AIS in your bank?

   There are many training programs, but random and ill-considered. The training on the new system must be for all management levels including the audit unit. Training courses should be reconsidered in order to be benefit to the trainees in their field.

   The trainer was trained by the company designed the new system. The employees are not satisfied with new system because they are not familiar with it and a lack of a culture of development.

2. What is the role that employees play in improving the AIS?

   The employees submit their opinions to the management about the new system.

3. To what extent do you think the training and up-skilling of the workforce is needed to realise the benefits of AIS adequately/satisfactorily?

   The training and up-skilling is very important to realise the benefits of AIS with good communication infrastructure, so with out skilled staff and communication infrastructure can not achieve its benefits adequately and satisfactorily.

4. In general, to what extent do you think employees' skills in IT can help to improve business performance?

   Employees' skills in IT are very important to improve business performance. However, highly skilled staff has a disadvantage if it used bad use, especially when a staff is more skilled than their manager, thus the sills should be equal.

5. In your opinion what are the effects of training and up-skilling the workforce on the delivery of the benefits of investing in IT in your bank?

   Training and up-skilling has a positive impact but not as planed because the random and a wrong candidate for the trainees.

The Checklist Questions:

1. Has the training and up-skilling of the workforce led to the following benefits? Please rank the benefits in terms of importance. (1 more important...etc)

Benefits	Yes	No	Rank
Improve customer services	√		2
Raise the capacity to deal with the growth in number of transactions	√		1
Improve working conditions and competition	√		3
Improve the accounting control in terms of accuracy and recording transactions	√		4
Reduce the number of employees	√		7
Reduce a number of errors	√		6
Improve competitive advantage of the Bank	√		5

Appendix No 14: Interview (8): Wahda bank

I. General questions:

- The respondent's name and position
  Najuib Barasi, Head of Credit Management in Wahda Bank
- How long is length of experience?
  32 years
- Highest level of education and qualifications.
  Doctorate of Accounting

II. The extent and nature of AIS investment (RESEARCH QUESTION 1):

The Semi-structured interview questions:

1. Could you describe the nature and attributes of the accounting information systems in your bank?
   In 2007, the bank began use a new system that is FLEXCUBE system in partnership with Central Bank of Libya and another four Libyan banks, and the connection between bank branches by fibre optic and satellite. The new system has huge capacities in banking business. However, now the system is not used fully in all branches. The work is continuing to install the system in rest of branches and link them by the network. The accounting information system entirely depends on the use of computer.

2. How would you characterise your bank's use of Information Technology (IT)?
   Due to a commitment of the bank with Central Bank of Libya through the NPS project, the bank has no chance to invest in the information technology as a competitive weapon. The Investment in information technology is as required by the project as required by the NPS project.

3. What are the types of the information generated by the accounting system in your bank?
   The accounting information system provides all required information such as managerial reports and operational reports on business transactions for internal users, and financial statements for external users.

4. Could you let me know about the most important problems and obstacles that arise during the operation of the accounting information system and how you cope with them?
   As a result of incomplete of installation of the new system in all branches there is a problem in availability of information on time, and there is difficult to obtain it. Moreover, the information is not accurate as required due to the staff is not qualified or there is no good rehabilitation for them.
   There is also problem of the infrastructure of communication in the country.
   However, after a full using of the system and completeness of the networking between the branches can overcome these problems.

5. Do you think the system is easy to use/ simple? Why? Why not?
   The new system is easy and simple to use if there is a good training.

6. In your bank, what are the main areas of business which IT projects have covered?
   The most of banking business activities have been covered by information technology projects.

The Checklist Questions:

1. Who are the users of the information generated by the accounting information system in your bank? Please rank the affirmative answers in order of frequency of use. (1 being the most frequent user...etc)

Users	Yes	No	Rank
Shareholders	√		5
Governmental bodies	√		6
Tax department in the finance ministry	√		7
Managers in your bank	√		1
Investors and creditors	√		4
Operatives, controllers, office staff	√		3
Bank top executives/Board members	√		2

III. The investment in AIS, business processes and business performance (RQ2):

The Semi-structured interview questions:

1. How would you assess the effectiveness and the efficiency of the accounting information system in your bank?
   The accounting information system is efficient and effective in providing monthly reports and statistical to central bank and other governmental bodies. The problem of delays in data entry that prevent the system to be more effective as a result of incomplete of installation of the new system in all branches, and incomplete the link between bank branches. In the near future these problems can be avoided.
   Although high cost of the new system but its benefits is greater especially in long term as a result of increasing of existing services and providing new services.

2. How does investment in information technology influence the bank's reputation?
   The investment in information technology has a significant impact on the bank's reputation, provided the availability of technology with good communication.

3. In your opinion, to what extent are the current accounting systems effective in supporting managers in decision-making and problem solving? Please give examples as appropriate.
   The system is effective in supporting managers in decision-making and problem solving.
   However, as the linkage between the branches has not been completed there are delays in obtaining information on time. This delays led to delays in decision-making as well.
   The recommendations for the current system to meet management requirement are accelerate the completion of the installation of the new system, and training of staff and increase their skills as well as improving communications.

4. In your opinion, to what extent is there a need to develop the accounting information system in response to the development and changes in the Libyan business environment? (e.g. NPS)
   There is an urgent need to develop the accounting information system, and this what the bank is doing through the participation the NPS project and using developed FLEXCUBE system.

5. What role has information technology played in response to the competition that your bank has faced?
   The using of information technology lead to providing services to customers in quicker time, convenient manner, better quality and less effort and cost, thus these will give a competitive advantage to the bank.

6. In your opinion, how does the accounting information system in your bank develop business performance?

The accounting information system develops the business performance by providing accurate information on time to a decision maker with good training and up-skilling the employees.
Now the level of the accounting information system is not enough to improve business. It needs to good training in technology area, take advantage from advanced foreign banks in this area.

7. What is the effect of the upgrade in IS /IT infrastructure on the structure of the workforce and activities in your bank?

The upgrade in IS/IT infrastructure positively influences on bank's income through improving existing services, providing a new services, supporting security of system and saving time and effort.

8. How has the upgrade of IS/IT infrastructure impacted on banking transaction costs and the number of staff / branches? Please explain.

The upgrade in IS/IT infrastructure decrease cost of transactions but regarding the number of staff there is no impact because with using technology, there will be new business activities that need more employees.
Regarding the number of branches, it depend on the feasibility study and market study but the use of technology may reduce the number of branches

The Checklist Questions:

1. From the list below, what are the factors driving investments in Information Technology in your bank? Please rank the affirmative factors in order of importance. (1 most important…etc).

Factors	**Yes**	**No**	**Rank**
Create overall market growth (create new demands)	√		3
Market share growth (take from competition)	√		5
Defend current market share position	√		6
Improve and increase customer services	√		1
Cut service prices/lower service costs	√		2
Increase internal efficiency	√		8
Increase understanding of customer needs	√		4
Increase efficiency of business transactions	√		7

2. Which of the following factors contribute to the success of your information technology bank? Please rank the contributors in order of importance. (1 most contributory...etc)

Contributors	**Yes**	**No**	**Rank**
Technical skills of information system staff members	√		1
Alignment of information system and business strategies	√		7
Customer service attitude towards information systems	√		8
Supportive bank management/users	√		2
Partnering with external service provider(s)	√		3
Adequate funding	√		4
Reduce cost and errors	√		6
Provide quality and innovation services to the customer	√		5

3. Please respond to the statements below using Yes or No and rank affirmative answers in order of importance. (1 more important...etc)

Statements	Yes	No	Rank
Information technology enables your bank to increase revenues	√		1
Information technology provides a way for your bank to reduce costs	√		2
Information technology gives your bank competitive advantage	√		3
Information technology assists and supports the needs of your bank's business	√		5
Information technology is an important component and is aligned to your business strategy	√		6
Information technology plays an integral role in meeting customer requirements	√		4

4. Does your bank make the following items available to implement, support and develop accounting information systems? Please rank the affirmative items in terms of their availability. (1 more available...etc).

Items	Yes	No	Rank
Enough funds for on-going investment in AIS	√		1
Technical tools to develop and support AIS	√		3
Outside specialist experts when required	√		2
Skilled personal to implement and support the AIS		√	

5. Do you agree that the following benefits of the information technology banking services are evidenced by your bank? Pleas rank the evidenced benefits in terms of your agreement. (1 more important…etc).

Benefits	Yes	No	Rank
It is easy to use IT banking services	√		3
IT banking services save your time	√		1
IT banking services make your banking more convenient	√		2
IT banking services provide privacy in your banking transaction	√		4
IT banking services provide accurate account information		√	

IV. The importance of training and up-skilling of the workforce (RQ3)

1. In general, could you assess the training and up-skilling of the workforce programmes and policies related to AIS in your bank?
   There are no training courses as a required level in terms of number and quality. The bank depends on the courses that are organised by central bank of Libya. The employees were trained on the new system by bank's trainer inside the bank. The employees are satisfied with new system because it saved time and effort, the gust need moor training.

2. What is the role that employees play in improving the AIS?
   There is a role of employees in improving the accounting information system by submitting their suggestions to the management.

3. To what extent do you think the training and up-skilling of the workforce is needed to realise the benefits of AIS adequately/satisfactorily?
   Well- planned training and up-skilling is very important to realise the benefits of AIS. In addition, proper nomination of employees for courses training and continuous training.

4. In general, to what extent do you think employees' skills in IT can help to improve business performance?
   Employees' skills in IT are greatly help to improve business performance with an accounting qualification. They lead to expediting the completion of work and providing information more accuracy in time.

5. In your opinion what are the effects of training and up-skilling the workforce on the delivery of the benefits of investing in IT in your bank?
   Training and up-skilling has a positive impact through reducing errors and expediting the completion of business.

The Checklist Questions:

1. Has the training and up-skilling of the workforce led to the following benefits? Please rank the benefits in terms of importance. (1 more important...etc)

Benefits	**Yes**	**No**	**Rank**
Improve customer services	√		1
Raise the capacity to deal with the growth in number of transactions	√		4
Improve working conditions and competition	√		5
Improve the accounting control in terms of accuracy and recording transactions	√		6
Reduce the number of employees	√		7
Reduce a number of errors	√		2
Improve competitive advantage of the Bank	√		3

Appendix No 15: Interview (9): Wahda bank

I. General questions:

- The respondent's name and position
  Idris lahaimer, Head of Risk Management in Wahda Bank
- How long is length of experience?
  3 years
- Highest level of education and qualifications.
  Doctorate of Accounting

II. The extent and nature of AIS investment (RESEARCH QUESTION 1):

The Semi-structured interview questions:

1. Could you describe the nature and attributes of the accounting information systems in your bank?
   The development of accounting information system is continuing since the established of the bank in 1970. At the end of nineties, the bank began to use the technology in the accounting information system through use some local information system. At the beginning of 2003, the bank adopted advanced global system, which is FLEXCUBE system through the NPS under the auspices of the Central Bank of Libya. In 2007, the bank has begun applied the new system in several branches. The new system provides information in a timely manner to the management about all business activities of the bank. Using of computer in all business of the bank.

2. How would you characterise your bank's use of Information Technology (IT)?
   Except the advanced FLEXCUBE system, the bank has not any ambition to getting far in the technology. In addition, the bank does not view the information technology as a critical and essential investment area as a competitive weapon. The bank just invests in information technology accordingly to requirements of banking business as a result of the lack of communications infrastructure.

3. What are the types of the information generated by the accounting system in your bank?
   The accounting information system provides all required information such as managerial reports and operational reports on business transactions for internal users, and financial statements for external users.

4. Could you let me know about the most important problems and obstacles that arise during the operation of the accounting information system and how you cope with them?
   As a result of incomplete of installation of the new system in all branches there is a problem in availability of information on time, and there is difficult to obtain it. However, the system will provide all required information to all management levels after installation the system in all bank branches.

5. Do you think the system is easy to use/ simple? Why? Why not?
   Currently, the bank is using a part of the system, so it is easy and simple to use because it saves time and effort. To using full capacities of the system the employees need more a good training and up-skilling.

6. In your bank, what are the main areas of business which IT projects have covered?
Regarding branches that have used the new system and are linked by the network, the most of banking business activities have been covered by information technology projects.

The Checklist Questions:

1. Who are the users of the information generated by the accounting information system in your bank? Please rank the affirmative answers in order of frequency of use. (1 being the most frequent user...etc)

Users	Yes	No	Rank
Shareholders	√		7
Governmental bodies	√		3
Tax department in the finance ministry	√		2
Managers in your bank	√		4
Investors and creditors	√		5
Operatives, controllers, office staff	√		6
Bank top executives/Board members	√		1

III. The investment in AIS, business processes and business performance (RQ2):

The Semi-structured interview questions:

1. How would you assess the effectiveness and the efficiency of the accounting information system in your bank?
The new system is efficient and effective and provides required information on time for internal and external users. However, it depends on an ability of decision maker to benefit from this information well. Regarding the cost and benefit of the system there was not a feasibility study of the system because it was imposed by the Central Bank of Libya. Despite this its benefits will be greater in long term.

2. How does investment in information technology influence the bank's reputation?
The investment in information technology has a positive influence on the bank's reputation. The information system helps the bank to achieve its goals including a competitive advantage.

3. In your opinion, to what extent are the current accounting systems effective in supporting managers in decision-making and problem solving? Please give examples as appropriate.
Currently, the system is not sufficient in supporting managers in decision-making and problem solving because the new system has not been used in all branches. The recommendation is speed up the use of the new system in all branches because it provides all management requirements for decision-making and solve problems.

4. In your opinion, to what extent is there a need to develop the accounting information system in response to the development and changes in the Libyan business environment? (e.g. NPS)
It is a necessary to develop accounting information system in response to the developments in Libyan business environment.

5. What role has information technology played in response to the competition that your bank has faced?
The services are developed by development of information technology, and banking depends on the information technology, thus if there was no investment in technology, the bank will not be able to compete.

6. In your opinion, how does the accounting information system in your bank develop business performance?

   The accounting information system is not sufficient to develop business performance but could be improved through a completion of networking link between branches, and good training and up-skilling the employees.

7. What is the effect of the upgrade in IS /IT infrastructure on the structure of the workforce and activities in your bank?

   The upgrade in IS/IT infrastructure gives a big chance to developing banking services and providing new services. It gives a big chance to developing banking services and providing new services.

8. How has the upgrade of IS/IT infrastructure impacted on banking transaction costs and the number of staff / branches? Please explain.

   The upgrade in IS/IT infrastructure has decreased cost of transactions a result of decreased time of transaction completion and reduced number of employees. However, as a result of decreased of cost the number of branches will be increased.

The Checklist Questions:

1. From the list below, what are the factors driving investments in Information Technology in your bank? Please rank the affirmative factors in order of importance. (1 most important…etc).

Factors	Yes	No	Rank
Create overall market growth (create new demands)	√		5
Market share growth (take from competition)	√		7
Defend current market share position	√		6
Improve and increase customer services	√		4
Cut service prices/lower service costs	√		3
Increase internal efficiency	√		2
Increase understanding of customer needs		√	
Increase efficiency of business transactions	√		1

2. Which of the following factors contribute to the success of your information technology bank? Please rank the contributors in order of importance. (1 most contributory...etc)

Contributors	Yes	No	Rank
Technical skills of information system staff members	√		3
Alignment of information system and business strategies		√	
Customer service attitude towards information systems		√	
Supportive bank management/users	√		1
Partnering with external service provider(s)		√	
Adequate funding	√		5
Reduce cost and errors	√		2
Provide quality and innovation services to the customer	√		4

3. Please respond to the statements below using Yes or No and rank affirmative answers in order of importance. (1 more important...etc)

Statements	Yes	No	Rank
Information technology enables your bank to increase revenues	√		4
Information technology provides a way for your bank to reduce costs	√		3
Information technology gives your bank competitive advantage	√		1
Information technology assists and supports the needs of your bank's business	√		5
Information technology is an important component and is aligned to your business strategy	√		6
Information technology plays an integral role in meeting customer requirements	√		2

4. Does your bank make the following items available to implement, support and develop accounting information systems? Please rank the affirmative items in terms of their availability. (1 more available...etc).

Items	Yes	No	Rank
Enough funds for on-going investment in AIS		√	
Technical tools to develop and support AIS	√		2
Outside specialist experts when required	√		3
Skilled personal to implement and support the AIS	√		1

5. Do you agree that the following benefits of the information technology banking services are evidenced by your bank? Pleas rank the evidenced benefits in terms of your agreement. (1 more important…etc).

Benefits	Yes	No	Rank
It is easy to use IT banking services		√	
IT banking services save your time	√		1
IT banking services make your banking more convenient	√		2
IT banking services provide privacy in your banking transaction	√		4
IT banking services provide accurate account information	√		3

IV. The importance of training and up-skilling of the workforce (RQ3)

1. In general, could you assess the training and up-skilling of the workforce programmes and policies related to AIS in your bank?
   There is no plan for training and up-skilling the workforce thus it led to a lack of application the new system well. The employees were trained by bank's trainer inside the bank.

2. What is the role that employees play in improving the AIS?
   There is a role of employees in improving the accounting information system. There were teams of senior officials in the bank. They suggested some changes about the new system but this time did not continue.

3. To what extent do you think the training and up-skilling of the workforce is needed to realise the benefits of AIS adequately/satisfactorily?
   If there is not a qualified human element in accounting and technology area can not achieve the benefits of the accounting information system adequately and satisfactorily.

4. In general, to what extent do you think employees' skills in IT can help to improve business performance?
   Whenever there is use of sophisticated technology whenever there is a greater need for skilled staff in technology.
   Skills in IT lead to a speed and accuracy of business and hence obtain a good quality of information and thus help to improve business performance.

5. In your opinion what are the effects of training and up-skilling the workforce on the delivery of the benefits of investing in IT in your bank?
   The lack of a good training and bad nomination of training have led to a lack of achieving the benefits of investing in information system in the bank.

The Checklist Questions:

1. Has the training and up-skilling of the workforce led to the following benefits? Please rank the benefits in terms of importance. (1 more important...etc)

Benefits	Yes	No	Rank
Improve customer services		√	
Raise the capacity to deal with the growth in number of transactions		√	
Improve working conditions and competition		√	
Improve the accounting control in terms of accuracy and recording transactions	√		1
Reduce the number of employees		√	
Reduce a number of errors	√		2
Improve competitive advantage of the Bank		√	

Appendix No 16: Interview (10): Wahda bank

I. General questions:

- The respondent's name and position
  Mari Barasi, Head of Budget Department in Wahda Bank
- How long is length of experience?
  10 years
- Highest level of education and qualifications.
  Bachelor of Accounting

II. The extent and nature of AIS investment (RESEARCH QUESTION 1):

The Semi-structured interview questions:

1. Could you describe the nature and attributes of the accounting information systems in your bank?
   Until 2005 there was no standardised chart of accounts in commercial banks. In 2005 a committee was formed to unify the chart of accounts between banks. In 2007, the Wahda Bank was the first bank to apply this chart, which was the basis for the application of a new FLEXCUBE system. There were several plans to implement advanced technology, but with the FLEXCUBE system there is no need to develop the system except development the communications because this system is adequate and sufficient for banking business. There is a fully computerisation for accounting information system in the bank.

2. How would you characterise your bank's use of Information Technology (IT)?
   The information technology is a critical and essential investment area because it became a reality imposes itself and very urgent. There is keep pace with the technological development, but still there is no optimal use for it.

3. What are the types of the information generated by the accounting system in your bank?
   The accounting information system provides financial statements and statistical reports for external users, and all required information such as managerial reports and operational reports on business transactions for internal users.

4. Could you let me know about the most important problems and obstacles that arise during the operation of the accounting information system and how you cope with them?
   The most important problem is that incomplete of installation of the new system in all branches. This problem impacts on an availability, accuracy and quality of information

5. Do you think the system is easy to use/ simple? Why? Why not?
   The system is easy and simple to use just it needs qualified and specialized staff, because the system is clear and there are instructions for all banking transactions.

6. In your bank, what are the main areas of business which IT projects have covered?
   The NPS project covers all areas of business, and the bank now is applying the technology in the most of these areas.

The Checklist Questions:

1. Who are the users of the information generated by the accounting information system in your bank? Please rank the affirmative answers in order of frequency of use. (1 being the most frequent user...etc)

Users	Yes	No	Rank
Shareholders	√		4
Governmental bodies	√		3
Tax department in the finance ministry		√	
Managers in your bank	√		2
Investors and creditors		√	
Operatives, controllers, office staff		√	
Bank top executives/Board members	√		1

III. The investment in AIS, business processes and business performance (RQ2):

The Semi-structured interview questions:

1. How would you assess the effectiveness and the efficiency of the accounting information system in your bank?
   The new system is efficient and effective where it provides required information on time. The obstacles that keep the bank from being more affective AIS is the communications as a result of incomplete of installation of the new system in all branches and networking between branches, and a lack of good training.
   Because the central bank of Libya bears a large part of the cost of system, so the benefits great comparing with its cost.

2. How does investment in information technology influence the bank's reputation?
   The investment in information technology has a significant impact on the bank's reputation. The customer has become more aware and thus takes into account the time factor. The most important feature of the information technology is saves time and effort.

3. In your opinion, to what extent are the current accounting systems effective in supporting managers in decision-making and problem solving? Please give examples as appropriate.
   Currently, the system is sufficient in supporting managers in decision-making and problem solving. The system to be more effective in supporting managers, the operators of the system must have a qualified accounting. In 2005 the management changed the accounting information system, which has helped in supporting managers in decision-making.

4. In your opinion, to what extent is there a need to develop the accounting information system in response to the development and changes in the Libyan business environment? (e.g. NPS)
   There is a need to develop accounting information system at the same time with a development of IT. The bank is one of the participants of the NPS project. This project includes all banking business.

5. What role has information technology played in response to the competition that your bank has faced?
   The role of information technology in response to the competition meeting customers' requirements, reducing time of transactions accomplish and saving time. In addition, maintaining existing customers and obtaining new customers.

6. In your opinion, how does the accounting information system in your bank develop business performance?
   The accounting information system is sufficient but need more efficiency to develop business performance. It could be improved through a completion of networking link between branches.

7. What is the effect of the upgrade in IS /IT infrastructure on the structure of the workforce and activities in your bank?
   The upgrade in IS/IT infrastructure helps employees to accomplish their work well, and helps manager to assess performance of the employees. Moreover, it helps to improvement and development of a quality of banking services.

8. How has the upgrade of IS/IT infrastructure impacted on banking transaction costs and the number of staff / branches? Please explain.
   The upgrade in IS/IT infrastructure has a little impact on reducing the number of staff, and significant impact in decreasing cost of transactions. However, the number of branches depends on the feasibility study.

The Checklist Questions:

1. From the list below, what are the factors driving investments in Information Technology in your bank? Please rank the affirmative factors in order of importance. (1 most important…etc).

Factors	Yes	No	Rank
Create overall market growth (create new demands)		√	
Market share growth (take from competition)	√		4
Defend current market share position	√		5
Improve and increase customer services	√		1
Cut service prices/lower service costs	√		6
Increase internal efficiency	√		2
Increase understanding of customer needs	√		3
Increase efficiency of business transactions	√		7

2. Which of the following factors contribute to the success of your information technology bank? Please rank the contributors in order of importance. (1 most contributory...etc)

Contributors	Yes	No	Rank
Technical skills of information system staff members	√		3
Alignment of information system and business strategies	√		2
Customer service attitude towards information systems	√		5
Supportive bank management/users	√		4
Partnering with external service provider(s)	√		6
Adequate funding	√		1
Reduce cost and errors	√		7
Provide quality and innovation services to the customer	√		8

3. Please respond to the statements below using Yes or No and rank affirmative answers in order of importance. (1 more important...etc)

Statements	Yes	No	Rank
Information technology enables your bank to increase revenues	√		3
Information technology provides a way for your bank to reduce costs	√		4
Information technology gives your bank competitive advantage	√		2
Information technology assists and supports the needs of your bank's business	√		5
Information technology is an important component and is aligned to your business strategy	√		1
Information technology plays an integral role in meeting customer requirements	√		6

4. Does your bank make the following items available to implement, support and develop accounting information systems? Please rank the affirmative items in terms of their availability. (1 more available...etc).

Items	Yes	No	Rank
Enough funds for on-going investment in AIS	√		1
Technical tools to develop and support AIS	√		2
Outside specialist experts when required	√		4
Skilled personal to implement and support the AIS	√		3

5. Do you agree that the following benefits of the information technology banking services are evidenced by your bank? Pleas rank the evidenced benefits in terms of your agreement. (1 more important…etc).

Benefits	Yes	No	Rank
It is easy to use IT banking services	√		4
IT banking services save your time	√		3
IT banking services make your banking more convenient	√		5
IT banking services provide privacy in your banking transaction	√		2
IT banking services provide accurate account information	√		1

IV. The importance of training and up-skilling of the workforce (RQ3)

1. In general, could you assess the training and up-skilling of the workforce programmes and policies related to AIS in your bank?
   Still obtaining advantage of the courses training is not good because of the infelicitous nominations of the courses training. The employees have had trained by the trainers inside the bank, and the trainers were trained outside the bank by the company that designed the systems.
   The employees are not completely satisfied with the new system because the system is not completely applied and there are some employees not qualified.

2. What is the role that employees play in improving the AIS?
   There is a role of employees in improving the accounting information system through submission their suggestions and notes to the management

3. To what extent do you think the training and up-skilling of the workforce is needed to realise the benefits of AIS adequately/satisfactorily?
   The important element to realise the benefits of AIS is the training and up-skilling the workforce, as without qualified employees can not achieve its benefits. It should there is no limited budget for training.

4. In general, to what extent do you think employees' skills in IT can help to improve business performance?
   The employees' skills in IT can greatly help to improve business performance, through providing information, saving time and organising work as well.

5. In your opinion what are the effects of training and up-skilling the workforce on the delivery of the benefits of investing in IT in your bank?
   The training after using the new system has had a good impact on the delivery of the benefits of investing in information technology.

The Checklist Questions:

1. Has the training and up-skilling of the workforce led to the following benefits? Please rank the benefits in terms of importance. (1 more important...etc)

Benefits	**Yes**	**No**	**Rank**
Improve customer services	√		2
Raise the capacity to deal with the growth in number of transactions	√		3
Improve working conditions and competition	√		5
Improve the accounting control in terms of accuracy and recording transactions	√		1
Reduce the number of employees		√	
Reduce a number of errors	√		6
Improve competitive advantage of the Bank	√		4

Appendix No 17: Interview (11): Alegmaa alarabi bank

I. General questions:

- The respondent's name and position
  Fawzia Adali, Manager of Accounting Management in Alegmaa Alarabi Bank
- How long is length of experience?
  11 years
- Highest level of education and qualifications.
  Bachelor of Accounting

II. The extent and nature of AIS investment (RESEARCH QUESTION 1):

The Semi-structured interview questions:

1. Could you describe the nature and attributes of the accounting information systems in your bank?
   The bank has an accounting information system since its establishment in 2003. The development of system are continued, and in absence of a linkage between branches, the branches' budgets are collected and then prepare a consolidated budget at the level of bank by Microsoft Office Excel.
   The system was designed by national company and its abilities are limited.

2. How would you characterise your bank's use of Information Technology (IT)?
   The bank does not use information technology as a competitive weapon, but according to what the banking business requires. However, the bank views information technology as an essential investment area, but according to the need for it.

3. What are the types of the information generated by the accounting system in your bank?
   The system provides a financial statements and statistical for external users, and provides managerial reports about banking activities, but it does not provides some reports for senior management and are prepare manually.

4. Could you let me know about the most important problems and obstacles that arise during the operation of the accounting information system and how you cope with them?
   There are some technical problems especially in linkage between devices inside the branches. These problems impact on the availability of information. In addition, there is lack in quality of data because the lack of training. The system is supported by the company that designed the system.

5. Do you think the system is easy to use/ simple? Why? Why not?
   The system is easy and uncomplicated to use because it is not a highly advanced.

6. In your bank, what are the main areas of business which IT projects have covered?
   The most of bank's activities have been covered by IT projects except some area such as ATMs, Visa cards, mobile banking and linkage between the branches.

The Checklist Questions:

1. Who are the users of the information generated by the accounting information system in your bank? Please rank the affirmative answers in order of frequency of use. (1 being the most frequent user...etc)

Users	Yes	No	Rank
Shareholders	√		6
Governmental bodies	√		4
Tax department in the finance ministry	√		5
Managers in your bank	√		1
Investors and creditors		√	
Operatives, controllers, office staff	√		2
Bank top executives/Board members	√		3

III. The investment in AIS, business processes and business performance (RQ2):

The Semi-structured interview questions:

1. How would you assess the effectiveness and the efficiency of the accounting information system in your bank?
   The system is not effective and efficient enough because there are many faults, which caused the system stops working; it is resulted from the system capabilities are finite to deal with huge volume of data. Moreover the current system does not provide required information to internal users unless it is prepared manually or by excel.
   Despite the cost of system is high but it needs to development or changing with other more advanced.

2. How does investment in information technology influence the bank's reputation?
   The investment in information technology affects on the bank's reputation in terms of providing better services and thus increasing income.

3. In your opinion, to what extent are the current accounting systems effective in supporting managers in decision-making and problem solving? Please give examples as appropriate.
   The system is fairly effective in supporting managers in decision-making and problem solving, especially in credit area, but regarding the financial situation of the bank there is delay as a result there is no linkage between branches.

4. In your opinion, to what extent is there a need to develop the accounting information system in response to the development and changes in the Libyan business environment? (e.g. NPS)
   Due to development in the Libyan business environment there is a significant need to develop its information system. The management is seeking to develop it system because there are some areas in the NPS project, which should be applied by the bank such as real time gross settlement system (RTGS) and automated clearing house (ACH).

5. What role has information technology played in response to the competition that your bank has faced?
   The role of information technology in the competition is that providing good and comfort services to the customers, thus it leads to maintaining existing customer and obtaining new customers. It also enables the bank for using new products and improving existing services.

6. In your opinion, how does the accounting information system in your bank develop business performance?
   The accounting information system develops the business performance by providing good level of services and providing new banking activities. The level of accounting information system is not sufficient and it needs to development, because the bank can not provide some banking activities, which based on advanced information technology. The business performance can be improved by adopting developed information technology.

7. What is the effect of the upgrade in IS /IT infrastructure on the structure of the workforce and activities in your bank?
   The upgrade in IS/IT infrastructure increases activities of business and decreases time and cost of transactions.

8. How has the upgrade of IS/IT infrastructure impacted on banking transaction costs and the number of staff / branches? Please explain.
   Whenever the used technology is developed, it leads to reduced number of employees. It also leads to increase number of branches in terms of geographical spread.

The Checklist Questions:

1. From the list below, what are the factors driving investments in Information Technology in your bank? Please rank the affirmative factors in order of importance. (1 most important…etc).

Factors	Yes	No	Rank
Create overall market growth (create new demands)	√		5
Market share growth (take from competition)		√	
Defend current market share position		√	
Improve and increase customer services	√		1
Cut service prices/lower service costs	√		4
Increase internal efficiency	√		3
Increase understanding of customer needs	√		2
Increase efficiency of business transactions	√		6

2. Which of the following factors contribute to the success of your information technology bank? Please rank the contributors in order of importance. (1 most contributory...etc)

Contributors	Yes	No	Rank
Technical skills of information system staff members	√		1
Alignment of information system and business strategies	√		2
Customer service attitude towards information systems	√		6
Supportive bank management/users	√		3
Partnering with external service provider(s)		√	
Adequate funding		√	
Reduce cost and errors	√		4
Provide quality and innovation services to the customer	√		5

3. Please respond to the statements below using Yes or No and rank affirmative answers in order of importance. (1 more important...etc)

Statements	Yes	No	Rank
Information technology enables your bank to increase revenues	√		4
Information technology provides a way for your bank to reduce costs	√		1
Information technology gives your bank competitive advantage		√	
Information technology assists and supports the needs of your bank's business	√		3
Information technology is an important component and is aligned to your business strategy	√		5
Information technology plays an integral role in meeting customer requirements	√		2

4. Does your bank make the following items available to implement, support and develop accounting information systems? Please rank the affirmative items in terms of their availability. (1 more available...etc).

Items	Yes	No	Rank
Enough funds for on-going investment in AIS	√		2
Technical tools to develop and support AIS	√		1
Outside specialist experts when required		√	
Skilled personal to implement and support the AIS	√		3

5. Do you agree that the following benefits of the information technology banking services are evidenced by your bank? Pleas rank the evidenced benefits in terms of your agreement. (1 more important…etc).

Benefits	Yes	No	Rank
It is easy to use IT banking services	√		2
IT banking services save your time	√		1
IT banking services make your banking more convenient	√		3
IT banking services provide privacy in your banking transaction	√		5
IT banking services provide accurate account information	√		4

IV. The importance of training and up-skilling of the workforce (RQ3)

1. In general, could you assess the training and up-skilling of the workforce programmes and policies related to AIS in your bank?
   There are no training programmes in the bank. At the beginning, the employees were trained by the company that designed the system. The current employees has had trained during their operation of the system.
   The employees are satisfied with the system because it is not developed enough. However, the senior management is not satisfied and needs more developed system to meet its requirement.

2. What is the role that employees play in improving the AIS?
   The employees have a role in improving the AIS through submit their suggestions to add or modify some reports for more details.

3. To what extent do you think the training and up-skilling of the workforce is needed to realise the benefits of AIS adequately/satisfactorily?
   The training and up-skilling is very required and necessary to realise the benefits of AIS adequately and satisfactorily.
   It leads to reduction in errors and saving time and effort for accomplishment of transactions, thus providing information more accuracy at an appropriate time.

4. In general, to what extent do you think employees' skills in IT can help to improve business performance?
   Employees' skills in IT help to improve business performance through a speed of transaction accomplishment. The skilled employees in IT avoid a lot of problems during operation of inputting data, and familiar with an advanced system.

5. In your opinion what are the effects of training and up-skilling the workforce on the delivery of the benefits of investing in IT in your bank?
   Training and up-skilling has a positive impact on efficiency of employees and increasing a speed completion of transactions.

The Checklist Questions:

1. Has the training and up-skilling of the workforce led to the following benefits? Please rank the benefits in terms of importance. (1 more important...etc)

Benefits	**Yes**	**No**	**Rank**
Improve customer services	√		1
Raise the capacity to deal with the growth in number of transactions	√		3
Improve working conditions and competition		√	
Improve the accounting control in terms of accuracy and recording transactions		√	
Reduce the number of employees		√	
Reduce a number of errors	√		2
Improve competitive advantage of the Bank		√	

Appendix No 18: Interview (12): Alegmaa alarabi bank

I. General questions:

- The respondent's name and position
  Waleed Altapoli, Manager of information technology in Alegmaa Alarabi Bank
- How long is length of experience?
  4 years
- Highest level of education and qualifications.
  Higher Diploma of Applications

II. The extent and nature of AIS investment (RESEARCH QUESTION 1):

The Semi-structured interview questions:

1. Could you describe the nature and attributes of the accounting information systems in your bank?
   The bank has had used an accounting information system since its establishment in 2003. The system was designed by national company. In 2006, the system was changed and use another system was designed by other national company. The bank uses the computer in all banking activities.

2. How would you characterise your bank's use of Information Technology (IT)?
   The bank does not use information technology as a competitive weapon, and does not view information technology as an essential investment area. The bank still uses a basic technology in banking business. However, the management are seeking to develop the system in the future.

3. What are the types of the information generated by the accounting system in your bank?
   The system provides required information for external and internal users, and provides daily managerial reports about banking activities.

4. Could you let me know about the most important problems and obstacles that arise during the operation of the accounting information system and how you cope with them?
   There are some technical problems in supporting and operation of the system and it are not related to the human element. The system is supported by the company that designed the system.

5. Do you think the system is easy to use/ simple? Why? Why not?
   The system is easy and flexible to use because it is basic and not highly developed.

6. In your bank, what are the main areas of business which IT projects have covered?
   There are some bank's activities have been covered by IT projects, because there are no good core banking and data centre, and it needs networking linkage between the branches.

The Checklist Questions:

1. Who are the users of the information generated by the accounting information system in your bank? Please rank the affirmative answers in order of frequency of use. (1 being the most frequent user...etc)

Users	Yes	No	Rank
Shareholders	√		4
Governmental bodies	√		5
Tax department in the finance ministry	√		6
Managers in your bank	√		2
Investors and creditors	√		7
Operatives, controllers, office staff	√		1
Bank top executives/Board members	√		3

III. The investment in AIS, business processes and business performance (RQ2):

The Semi-structured interview questions:

1. How would you assess the effectiveness and the efficiency of the accounting information system in your bank?
   The system is effective and efficient because it is easy to use and provides information in time. However, the important obstacle that keeps the being more effective AIS is that there is no networking between branches. This obstacle has caused to delay to obtaining information about all branches on time.
   In the bank, spending for information technology is not enough thus can not obtain the benefits of AIS in terms of providing required information on time to the management.

2. How does investment in information technology influence the bank's reputation?
   The investment in information technology leads to providing new services and saving customers time through speed accomplish of transaction.

3. In your opinion, to what extent are the current accounting systems effective in supporting managers in decision-making and problem solving? Please give examples as appropriate.
   The system is fairly effective in supporting managers in decision-making and problem solving, especially in credit decisions. The bank has not planed to change its system to support decision-making.
   The recommendations are obtain good core banking, data base and linkage between branches.

4. In your opinion, to what extent is there a need to develop the accounting information system in response to the development and changes in the Libyan business environment? (e.g. NPS)
   There is an urgent need to develop the accounting information system in response to the development in the Libyan business environment, especially in the NPS project, where in the future Libyan banks will be as one bank.

5. What role has information technology played in response to the competition that your bank has faced?
   The information technology has a significant role in response to the competition. The customers need now the speed accomplish of transaction regardless price of the service, thus the number of customer will be increased and the income will be increased as well.

6. In your opinion, how does the accounting information system in your bank develop business performance?
   The accounting information system develops the business performance through speed and accuracy of transactions, providing required information on time and providing new services.
   The level of accounting information system is fairly sufficient to develop business performance, and can be improved by investment in advanced technology.

7. What is the effect of the upgrade *in IS /IT infrastructure on* the structure of the workforce and activities in your bank?
   The upgrade in IS/IT infrastructure creates new banking activities and improves existing services and decreases cost of transactions through decreasing of its time and procedures.

8. How has the upgrade of IS/IT infrastructure impacted on banking transaction costs and the number of staff / branches? Please explain.
   The upgrade in IS/IT infrastructure leads to increasing number of branches when availability of good core banking, data centre and good communication infrastructure. However, it leads to decreasing number of employees.

The Checklist Questions:

1. From the list below, what are the factors driving investments in Information Technology in your bank? Please rank the affirmative factors in order of importance. (1 most important…etc).

Factors	Yes	No	Rank
Create overall market growth (create new demands)	√		8
Market share growth (take from competition)	√		4
Defend current market share position	√		5
Improve and increase customer services	√		1
Cut service prices/lower service costs	√		2
Increase internal efficiency	√		3
Increase understanding of customer needs	√		6
Increase efficiency of business transactions	√		7

2. Which of the following factors contribute to the success of your information technology bank? Please rank the contributors in order of importance. (1 most contributory...etc)

Contributors	Yes	No	Rank
Technical skills of information system staff members	√		2
Alignment of information system and business strategies	√		3
Customer service attitude towards information systems	√		7
Supportive bank management/users	√		5
Partnering with external service provider(s)		√	
Adequate funding	√		1
Reduce cost and errors	√		6
Provide quality and innovation services to the customer	√		8

3. Please respond to the statements below using Yes or No and rank affirmative answers in order of importance. (1 more important...etc)

Statements	Yes	No	Rank
Information technology enables your bank to increase revenues	√		1
Information technology provides a way for your bank to reduce costs	√		2
Information technology gives your bank competitive advantage	√		3
Information technology assists and supports the needs of your bank's business	√		4
Information technology is an important component and is aligned to your business strategy	√		5
Information technology plays an integral role in meeting customer requirements	√		6

4. Does your bank make the following items available to implement, support and develop accounting information systems? Please rank the affirmative items in terms of their availability. (1 more available...etc).

Items	Yes	No	Rank
Enough funds for on-going investment in AIS	√		3
Technical tools to develop and support AIS	√		2
Outside specialist experts when required		√	
Skilled personal to implement and support the AIS	√		1

5. Do you agree that the following benefits of the information technology banking services are evidenced by your bank? Pleas rank the evidenced benefits in terms of your agreement. (1 more important…etc).

Benefits	Yes	No	Rank
It is easy to use IT banking services	√		2
IT banking services save your time	√		3
IT banking services make your banking more convenient	√		4
IT banking services provide privacy in your banking transaction	√		5
IT banking services provide accurate account information	√		1

IV. The importance of training and up-skilling of the workforce (RQ3)

1. In general, could you assess the training and up-skilling of the workforce programmes and policies related to AIS in your bank?
   There are no any training programmes in the bank regarding information technology. However, there are other training courses for other banking areas.
   The employees are satisfied with the current system.

2. What is the role that employees play in improving the AIS?
   The employees have a role in improving the AIS where there is suggestions form that are studied and applied after approval of the management.

3. To what extent do you think the training and up-skilling of the workforce is needed to realise the benefits of AIS adequately/satisfactorily?
   The training and up-skilling is very important to achieve the benefits of AIS adequately and satisfactorily, and it also make the employee do well in his/her field.

4. In general, to what extent do you think employees' skills in IT can help to improve business performance?
   Employees' skills in IT are very helpful to improve business performance because it makes tasks of supporter easer, and thus saves effort and time, and improves business performance.

5. In your opinion what are the effects of training and up-skilling the workforce on the delivery of the benefits of investing in IT in your bank?
   Due to there are no training programmes regarding IT and there is enough number of trainers in the bank, so there are no effects of training and up-skilling the workforce on the delivery of the benefits of investing in IT in the bank.

The Checklist Questions:

1. Has the training and up-skilling of the workforce led to the following benefits? Please rank the benefits in terms of importance. (1 more important...etc)

Benefits	**Yes**	**No**	**Rank**
Improve customer services	√		4
Raise the capacity to deal with the growth in number of transactions	√		2
Improve working conditions and competition	√		7
Improve the accounting control in terms of accuracy and recording transactions	√		3
Reduce the number of employees	√		6
Reduce a number of errors	√		1
Improve competitive advantage of the Bank	√		5

Appendix No 19: Interview (13): Alegmaa alarabi bank

I. General questions:

- The respondent's name and position
  Hendawi Amenefi, Manager of Operations Management in Alegmaa Alarabi Bank
- How long is length of experience?
  30 years
- Highest level of education and qualifications.
  Bachelor of Accounting

II. The extent and nature of AIS investment (RESEARCH QUESTION 1):

The Semi-structured interview questions:

1. Could you describe the nature and attributes of the accounting information systems in your bank?
   The bank has an accounting information system since its establishment in 2003. The system was designed by national company and it is basic and simple but it meets current requirements of the bank and bank's customers. The bank has not recently implemented any advanced technology. There is only an evolution in the Swift system. There is an entire computerisation of accounting information system in the bank.

2. How would you characterise your bank's use of Information Technology (IT)?
   The bank does not compete at the cutting edge of innovation of the IT; it also does not use the IT as a competitive weapon. However, the information technology is a critical and essential investment area, but the bank stays current on technology, without getting far ahead of its competition. There is need to using of advanced information technology and the linkage between branches as well.

3. What are the types of the information generated by the accounting system in your bank?
   The system provides a financial statements and financial information on time especially regard to credit decisions. However, managerial reports are processed manually outside the system.

4. Could you let me know about the most important problems and obstacles that arise during the operation of the accounting information system and how you cope with them?
   There are some operating malfunctions resulting from the interruption of communication. These problems are simple and can be addressed quickly, it are technical problems and are not related to human element.

5. Do you think the system is easy to use/ simple? Why? Why not?
   The system is easy and simple to use because it is uncomplicated.

6. In your bank, what are the main areas of business which IT projects have covered?
   The most of currently bank's activities have been covered by IT projects.

The Checklist Questions:

1. Who are the users of the information generated by the accounting information system in your bank? Please rank the affirmative answers in order of frequency of use. (1 being the most frequent user...etc)

Users	Yes	No	Rank
Shareholders	√		5
Governmental bodies	√		3
Tax department in the finance ministry	√		6
Managers in your bank	√		1
Investors and creditors	√		4
Operatives, controllers, office staff	√		7
Bank top executives/Board members	√		2

III. The investment in AIS, business processes and business performance (RQ2):

The Semi-structured interview questions:

1. How would you assess the effectiveness and the efficiency of the accounting information system in your bank?
   The system is effective in terms of providing information at an appropriate time and accuracy. The obstacle is the linkage between branches. The benefits that obtained from the system are greater than its cost.

2. How does investment in information technology influence the bank's reputation?
   Using of information technology result in providing faster services and more convenient, hence obtaining a competitive advantage. This advantage has a positive impact on the bank's reputation.

3. In your opinion, to what extent are the current accounting systems effective in supporting managers in decision-making and problem solving? Please give examples as appropriate.
   The system is consumedly effective in supporting managers in decision-making, especially in the credit decisions, but the problem in the lack of linkage between branches, thus it affects the timing of obtaining information and decision-making on time. Recommendations are developing the system and participate of the NPS project. There are no changes or any plans to change the system due to instability of the management in the recent period.

4. In your opinion, to what extent is there a need to develop the accounting information system in response to the development and changes in the Libyan business environment? (e.g. NPS)
   It is necessary to convoy this development through developing the system and networking between branches.

5. What role has information technology played in response to the competition that your bank has faced?
   The information technology has a significant role in the competition through availability of information, speed of transaction accomplishment and providing good services to the customers.

6. In your opinion, how does the accounting information system in your bank develop business performance?

   The level of accounting information system is enough in terms of the current banking, but in terms of customer services is not enough through speed of transaction accomplishment, speed of providing services, accuracy and speed of performance and reducing errors.

7. What is the effect of the upgrade in IS /IT infrastructure on the structure of the workforce and activities in your bank?

   The upgrade in IS/IT infrastructure lead to improving business performance, increasing banking business accuracy and increasing business activities.

8. How has the upgrade of IS/IT infrastructure impacted on banking transaction costs and the number of staff / branches? Please explain.

   The upgrade in IS/IT infrastructure lead to decreasing cost of transactions through decreasing number of employees, who are required to accomplish the transactions.

The Checklist Questions:

1. From the list below, what are the factors driving investments in Information Technology in your bank? Please rank the affirmative factors in order of importance. (1 most important…etc).

Factors	Yes	No	Rank
Create overall market growth (create new demands)	√		8
Market share growth (take from competition)	√		1
Defend current market share position	√		2
Improve and increase customer services	√		3
Cut service prices/lower service costs	√		4
Increase internal efficiency	√		6
Increase understanding of customer needs	√		5
Increase efficiency of business transactions	√		7

2. Which of the following factors contribute to the success of your information technology bank? Please rank the contributors in order of importance. (1 most contributory...etc)

Contributors	Yes	No	Rank
Technical skills of information system staff members	√		5
Alignment of information system and business strategies	√		6
Customer service attitude towards information systems	√		4
Supportive bank management/users	√		3
Partnering with external service provider(s)	√		8
Adequate funding	√		2
Reduce cost and errors	√		7
Provide quality and innovation services to the customer	√		1

3. Please respond to the statements below using Yes or No and rank affirmative answers in order of importance. (1 more important...etc)

Statements	Yes	No	Rank
Information technology enables your bank to increase revenues	√		3
Information technology provides a way for your bank to reduce costs	√		2
Information technology gives your bank competitive advantage	√		1
Information technology assists and supports the needs of your bank's business	√		4
Information technology is an important component and is aligned to your business strategy	√		5
Information technology plays an integral role in meeting customer requirements	√		6

4. Does your bank make the following items available to implement, support and develop accounting information systems? Please rank the affirmative items in terms of their availability. (1 more available...etc).

Items	Yes	No	Rank
Enough funds for on-going investment in AIS	√		1
Technical tools to develop and support AIS	√		4
Outside specialist experts when required	√		3
Skilled personal to implement and support the AIS	√		2

5. Do you agree that the following benefits of the information technology banking services are evidenced by your bank? Pleas rank the evidenced benefits in terms of your agreement. (1 more *important…etc).*

Benefits	Yes	No	Rank
It is easy to use IT banking services	√		4
IT banking services save your time	√		1
IT banking services make your banking more convenient	√		2
IT banking services provide privacy in your banking transaction	√		3
IT banking services provide accurate account information	√		5

IV. The importance of training and up-skilling of the workforce (RQ3)

1. In general, could you assess the training and up-skilling of the workforce programmes and policies related to AIS in your bank?
   There are no training programmes regarding the accounting information system in the bank. Employees are trained during their operation of the system inside the bank. The employees are satisfied with the system.

2. What is the role that employees play in improving the AIS?
   The employees submit their suggestions through proposals form to the management for study and apply.

3. To what extent do you think the training and up-skilling of the workforce is needed to realise the benefits of AIS adequately/satisfactorily?
   The training and up-skilling is very required to achieve the benefits of AIS adequately and satisfactorily.

4. In general, to what extent do you think employees' skills in IT can help to improve business performance?
   There is positive relationship between employees' skills and business performance through their good using and dealing with the information system.

5. In your opinion what are the effects of training and up-skilling the workforce on the delivery of the benefits of investing in IT in your bank?
   Training and up-skilling has a positive impact on the delivery of the benefits of investing in IT, where it leads to increasing efficiency of employees and improving business performance.

The Checklist Questions:

1. Has the training and up-skilling of the workforce led to the following benefits? Please rank the benefits in terms of importance. (1 more important...etc)

Benefits	Yes	No	Rank
Improve customer services	√		2
Raise the capacity to deal with the growth in number of transactions	√		3
Improve working conditions and competition	√		1
Improve the accounting control in terms of accuracy and recording transactions	√		7
Reduce the number of employees	√		5
Reduce a number of errors	√		4
Improve competitive advantage of the Bank	√		6

Appendix No 20: Interview (14): Alegmaa alarabi bank

I. General questions:

- The respondent's name and position
  Salah Algrare, Director General in Alegmaa Alarabi Bank
- How long is length of experience?
  12 years
- Highest level of education and qualifications.
  Bachelor of Accounting

II. The extent and nature of AIS investment (RESEARCH QUESTION 1):

The Semi-structured interview questions:

1. Could you describe the nature and attributes of the accounting information systems in your bank?
   The first an accounting information system was used since its establishment in 2003 was designed by national company. The system has been changed by another more developed system designed by other national company. The current system provides necessary information to decision maker. Although there is no linkage networking between branches, but all branches are using the same system. The most of bank activities depend on the computer.

2. How would you characterise your bank's use of Information Technology (IT)?
   Because the bank is still modern, the bank seeks to develop technology in stages. The current system is not developed enough for supporting advanced services such as Visa card, thus it does not compete at the cutting edge of innovation in the information technology area. However, the bank views the information technology as essential investment area, and it is planning to obtain advanced system and devices and continuous training for staff in the future.

3. What are the types of the information generated by the accounting system in your bank?
   The system provides a financial statements for external and internal users, and any required information by the management on time but at branch level. However, as a result of there is no linkage networking between the branches, at the bank level as a whole, there is a delay of providing required information and managerial reports on time about banking activities.

4. Could you let me know about the most important problems and obstacles that arise during the operation of the accounting information system and how you cope with them?
   Due to the of the system has a limited capabilities, some times there are failures in the system, which cause confusion in the banking, and it does not cover some banking activities. These problems are technical not humanity. Another problem is that the system is rented not property of the bank, therefore, the bank depends on the company designed the system in terms of support and maintenance the system.
   All Libyan banks have the problem of the lack of training and up-skilling the workforce.

5. Do you think the system is easy to use/ simple? Why? Why not?
   The system is easy and simple to use because it is simple and in Arabic.

6. In your bank, what are the main areas of business which IT projects have covered?
   The most of bank's activities have been covered by IT projects except some area such as ATMs, Visa cards, and there is not the linkage networking between the branches.

The Checklist Questions:

1. Who are the users of the information generated by the accounting information system in your bank? Please rank the affirmative answers in order of frequency of use. (1 being the most frequent user...etc)

Users	Yes	No	Rank
Shareholders	√		1
Governmental bodies	√		7
Tax department in the finance ministry	√		4
Managers in your bank	√		3
Investors and creditors	√		5
Operatives, controllers, office staff	√		6
Bank top executives/Board members	√		2

III. The investment in AIS, business processes and business performance (RQ2):

The Semi-structured interview questions:

1. How would you assess the effectiveness and the efficiency of the accounting information system in your bank?

   The system is fairly effective and efficient with respect to current banking business. The capabilities of the current system are limited. It ensures a quality of information and provides necessary information to external and internal users. Its cost is not high comparing with its benefits. The bank has several offers from some foreign company regarding modern and advanced system. However, the qualified human element and communications infrastructure are more important than advanced technology, because without them can not use advanced technology better using.

2. How does investment in information technology influence the bank's reputation?

   The investment in information technology has a significant effect on the bank's reputation in terms of providing quick and accurate information to management, investors and customers, thus it gives more confidence to the customers of the bank.

3. In your opinion, to what extent are the current accounting systems effective in supporting managers in decision-making and problem solving? Please give examples as appropriate.

   The current system is good for management of the bank to decision-making especially regarding to decisions of credit and investment. The recommendation is using advanced information technology for providing some information and statistical, which can not be obtained easily now. There is a plan to obtain an advanced system and linkage bank branches.

4. In your opinion, to what extent is there a need to develop the accounting information system in response to the development and changes in the Libyan business environment? (e.g. NPS)

   The NPS project needs a developed system to deal with it, so there is a significant need to develop its information system in the bank and linkage networking between all bank branches.

5. What role has information technology played in response to the competition that your bank has faced?

   The role of information technology in the competition is that saving time and effort, and facilitates accomplishment of transactions. For example, the using of internet banking and mobile banking. These lead to obtain a new customers and investors for the bank, thus obtain a competitive advantage.

6. In your opinion, how does the accounting information system in your bank develop business performance?
   The accounting information system is not enough for developing the business performance, because it does not meet the needs of external users such as customers and investors.
   It can be improved by adopting advanced technology.

7. What is the effect of the upgrade in IS /IT infrastructure on the structure of the workforce and activities in your bank?
   Effect of the upgrade in IS/IT infrastructure on bank activities through improving existing services and introducing new and convenient services.

8. How has the upgrade of IS/IT infrastructure impacted on banking transaction costs and the number of staff / branches? Please explain.
   The upgrade in IS/IT infrastructure leads to saving effort and time for accomplishment of transaction and decreasing cost of transactions and employees. However, it has not relationship with the branches number.

The Checklist Questions:

1. From the list below, what are the factors driving investments in Information Technology in your bank? Please rank the affirmative factors in order of importance. (1 most important…etc).

Factors	Yes	No	Rank
Create overall market growth (create new demands)	√		6
Market share growth (take from competition)	√		7
Defend current market share position	√		8
Improve and increase customer services	√		1
Cut service prices/lower service costs	√		5
Increase internal efficiency	√		2
Increase understanding of customer needs	√		3
Increase efficiency of business transactions	√		4

2. Which of the following factors contribute to the success of your information technology bank? Please rank the contributors in order of importance. (1 most contributory...etc)

Contributors	Yes	No	Rank
Technical skills of information system staff members	√		1
Alignment of information system and business strategies	√		6
Customer service attitude towards information systems	√		5
Supportive bank management/users	√		2
Partnering with external service provider(s)	√		3
Adequate funding	√		4
Reduce cost and errors	√		8
Provide quality and innovation services to the customer	√		7

3. Please respond to the statements below using Yes or No and rank affirmative answers in order of importance. (1 more important...etc)

Statements	Yes	No	Rank
Information technology enables your bank to increase revenues	√		6
Information technology provides a way for your bank to reduce costs	√		5
Information technology gives your bank competitive advantage	√		4
Information technology assists and supports the needs of your bank's business	√		1
Information technology is an important component and is aligned to your business strategy	√		2
Information technology plays an integral role in meeting customer requirements	√		3

4. Does your bank make the following items available to implement, support and develop accounting information systems? Please rank the affirmative items in terms of their availability. (1 more available...etc).

Items	Yes	No	Rank
Enough funds for on-going investment in AIS	√		2
Technical tools to develop and support AIS	√		1
Outside specialist experts when required	√		4
Skilled personal to implement and support the AIS	√		3

5. Do you agree that the following benefits of the information technology banking services are evidenced by your bank? Pleas rank the evidenced benefits in terms of your agreement. (1 more important…etc).

Benefits	Yes	No	Rank
It is easy to use IT banking services	√		5
IT banking services save your time	√		3
IT banking services make your banking more convenient	√		2
IT banking services provide privacy in your banking transaction	√		4
IT banking services provide accurate account information	√		1

IV. The importance of training and up-skilling of the workforce (RQ3)

1. In general, could you assess the training and up-skilling of the workforce programmes and policies related to AIS in your bank?
   The current training is now inside the bank but it is not as must be, because the system is simple and is not developed enough, so it not needs to training. The employees are satisfied with the system because it is not developed enough and it is simple.

2. What is the role that employees play in improving the AIS?
   The employees have a role in improving the AIS through submit their suggestions to the management. The suggestions are studied and applied according to the capabilities of the system.

3. To what extent do you think the training and up-skilling of the workforce is needed to realise the benefits of AIS adequately/satisfactorily?
   The continued training and up-skilling is very important to realise the benefits of AIS adequately and satisfactorily. The important investment is the investment in human elements through training and up-skilling the workforce. Without qualified employees can not realise the benefits of IT.

4. In general, to what extent do you think employees' skills in IT can help to improve business performance?
   Employees' skills in IT help to improve business performance and saves time and effort of employees in terms of raising speed, accuracy and efficiency.

5. In your opinion what are the effects of training and up-skilling the workforce on the delivery of the benefits of investing in IT in your bank?
   As a result of a lack of training, the training and up-skilling has a positive impact on the delivery of some benefits of investing in IT.

The Checklist Questions:

1. Has the training and up-skilling of the workforce led to the following benefits? Please rank the benefits in terms of importance. (1 more important...etc)

Benefits	Yes	No	Rank
Improve customer services	√		1
Raise the capacity to deal with the growth in number of transactions	√		4
Improve working conditions and competition	√		5
Improve the accounting control in terms of accuracy and recording transactions	√		2
Reduce the number of employees	√		7
Reduce a number of errors	√		3
Improve competitive advantage of the Bank	√		6

Appendix No 21: Interview (15): Alegmaa alarabi bank

I. General questions:

- The respondent's name and position
  Abdulla Soudeq, Manager of Internal Audit Management in Alegmaa Alarabi Bank
- How long is length of experience?
  39 years
- Highest level of education and qualifications.
  Bachelor of Accounting

II. The extent and nature of AIS investment (RESEARCH QUESTION 1):

The Semi-structured interview questions:

1. Could you describe the nature and attributes of the accounting information systems in your bank?
   The bank has used a simple accounting information system since its establishment in 2003, and there is no networking linkage between branches. The system meets bank business in terms of treasury and current accounts departments, and it provides information.
   As a result of non-linkage between branches, individually each branch uses the same system and their banking activities are gathered by correspondence in the accounting management. Thus, the financial situation of the bank is manually preparing.

2. How would you characterise your bank's use of Information Technology (IT)?
   The advanced technology has not been used in the bank yet. The current system is good in terms of basic banking activities. To use an advanced technology, must first there is a network linkage. There is a project to use ATMs, but has not been completed yet. Despite, the bank does not compete at the cutting edge of innovation of information technology; it looks at the information technology as an essential investment area.

3. What are the types of the information generated by the accounting system in your bank?
   The system provides required information to the management and provides managerial reports to internal users about the branches activities, which are manually prepared. There is no any providing information for external users.

4. Could you let me know about the most important problems and obstacles that arise during the operation of the accounting information system and how you cope with them?
   The important obstacle is non-linkage between branches, which impact on business performance through delay of obtaining information and thus this impact on decision-making on time.
   There are no problems regarding the human element and the system, because it is not very advanced.
   These problems are not related to all Libyan banks, because each bank has its own privacies.

5. Do you think the system is easy to use/ simple? Why? Why not?
   The system is easy to use because it is simple and uncomplicated.

6. In your bank, what are the main areas of business which IT projects have covered?
   There are some activities have been covered by information technology projects such as treasury and current accounts activities.

The Checklist Questions:

1. Who are the users of the information generated by the accounting information system in your bank? Please rank the affirmative answers in order of frequency of use. (1 being the most frequent user...etc)

Users	Yes	No	Rank
Shareholders		√	
Governmental bodies	√		5
Tax department in the finance ministry	√		6
Managers in your bank	√		2
Investors and creditors	√		4
Operatives, controllers, office staff	√		3
Bank top executives/Board members	√		1

III. The investment in AIS, business processes and business performance (RQ2):

The Semi-structured interview questions:

1. How would you assess the effectiveness and the efficiency of the accounting information system in your bank?

   The system is not effective and efficient because it is simple and does not keep pace with the evolving banking. The benefits of the current system are good comparing with its cost.

2. How does investment in information technology influence the bank's reputation?

   The investment in information technology affects on the bank's reputation, especially the networking linkage between branches makes it easier for customers for dealing with their accounts at any branch, and helps to provide information to decision maker on time. It will lead to increasing the bank's reputation

3. In your opinion, to what extent are the current accounting systems effective in supporting managers in decision-making and problem solving? Please give examples as appropriate.

   The system is not effective in supporting managers in decision-making and problem solving, because there is a delay of obtaining information.

   The recommendation is changing the current system with other more developed. The management has not changed or planed to change its system.

4. In your opinion, to what extent is there a need to develop the accounting information system in response to the development and changes in the Libyan business environment? (e.g. NPS)

   Due to development in the Libyan business environment there is an urgent need to develop information system. If the management has not kept pace with the developments in technology, it will be outside the banking business in Libya.

5. What role has information technology played in response to the competition that your bank has faced?

   The information technology has a significant role in terms of helping manager in decision-making when information is available. In addition, it enables the bank to obtain competitive advantage among other banks.

6. In your opinion, how does the accounting information system in your bank develop business performance?

The accounting information system in the bank is not enough to develop business performance. The human is the most important element of the system elements, so take care must be given to the human element regarding development and training, and then obtaining advanced system.

7. What is the effect of the upgrade in IS /IT infrastructure on the structure of the workforce and activities in your bank?

The upgrade in IS/IT infrastructure provides huge volume of information that can not be obtained by human element. It also enables the bank to expand by opining new branches, provides new services and developing banking business.

8. How has the upgrade of IS/IT infrastructure impacted on banking transaction costs and the number of staff / branches? Please explain.

The upgrade of IS/IT infrastructure impacted on banking transaction costs and the number of staff by decreasing the transactions cost and number of employees.

The Checklist Questions:

1. From the list below, what are the factors driving investments in Information Technology in your bank? Please rank the affirmative factors in order of importance. (1 most important…etc).

Factors	Yes	No	Rank
Create overall market growth (create new demands)	√		5
Market share growth (take from competition)		√	
Defend current market share position		√	
Improve and increase customer services	√		1
Cut service prices/lower service costs	√		2
Increase internal efficiency	√		3
Increase understanding of customer needs	√		5
Increase efficiency of business transactions	√		4

2. Which of the following factors contribute to the success of your information technology bank? Please rank the contributors in order of importance. (1 most contributory...etc)

Contributors	Yes	No	Rank
Technical skills of information system staff members	√		6
Alignment of information system and business strategies	√		3
Customer service attitude towards information systems	√		7
Supportive bank management/users	√		5
Partnering with external service provider(s)	√		8
Adequate funding	√		1
Reduce cost and errors	√		4
Provide quality and innovation services to the customer	√		2

3. Please respond to the statements below using Yes or No and rank affirmative answers in order of importance. (1 more important...etc)

Statements	Yes	No	Rank
Information technology enables your bank to increase revenues	√		5
Information technology provides a way for your bank to reduce costs	√		4
Information technology gives your bank competitive advantage	√		3
Information technology assists and supports the needs of your bank's business	√		6
Information technology is an important component and is aligned to your business strategy	√		2
Information technology plays an integral role in meeting customer requirements	√		1

4. Does your bank make the following items available to implement, support and develop accounting information systems? Please rank the affirmative items in terms of their availability. (1 more available...etc).

Items	Yes	No	Rank
Enough funds for on-going investment in AIS	√		4
Technical tools to develop and support AIS	√		1
Outside specialist experts when required	√		3
Skilled personal to implement and support the AIS	√		2

5. Do you agree that the following benefits of the information technology banking services are evidenced by your bank? Pleas rank the evidenced benefits in terms of your agreement. (1 more important…etc).

Benefits	Yes	No	Rank
It is easy to use IT banking services	√		4
IT banking services save your time	√		2
IT banking services make your banking more convenient	√		1
IT banking services provide privacy in your banking transaction	√		5
IT banking services provide accurate account information	√		3

IV. The importance of training and up-skilling of the workforce (RQ3)

1. In general, could you assess the training and up-skilling of the workforce programmes and policies related to AIS in your bank?
   There is no any training policy in the bank. The training is inside the bank during operation of the system.
   There is no survey has been done for the employees satisfaction, but in general the employees are satisfied with the system.

2. What is the role that employees play in improving the AIS?
   The employees submit their suggestion to the management by suggestions form.

3. To what extent do you think the training and up-skilling of the workforce is needed to realise the benefits of AIS adequately/satisfactorily?

The training and up-skilling is required to realise the benefits of AIS adequately and satisfactorily, because without training the workforce and qualified staff, the benefits of AIS can not be achieved.

4. In general, to what extent do you think employees' skills in IT can help to improve business performance?
   Skilled employees in IT help to improve business performance through a speed of transaction accomplishment, and they provide required information on time, these lead to decreasing the cost of transaction.

5. In your opinion what are the effects of training and up-skilling the workforce on the delivery of the benefits of investing in IT in your bank?
   The current training and up-skilling the workforce suffice the current requirements, but it does not lead to development of banking business.

The Checklist Questions:

1. Has the training and up-skilling of the workforce led to the following benefits? Please rank the benefits in terms of importance. (1 more important...etc)

Benefits	Yes	No	Rank
Improve customer services	√		3
Raise the capacity to deal with the growth in number of transactions	√		1
Improve working conditions and competition	√		2
Improve the accounting control in terms of accuracy and recording transactions	√		6
Reduce the number of employees	√		7
Reduce a number of errors	√		4
Improve competitive advantage of the Bank	√		5

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