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USER INVOLVEMENT AND PERCEIVED USEFULNESS

OF INFORMATION TECHNOLOGY

By

Sanabel El-Hakeem El-Attar

A Dissertation
Submitted to the Faculty of
Mississippi State University
in Partial Fulfillment of the Requirements
for the Degree of Doctor of Philosophy
in Instructional Systems and Workforce Development
in the Department of Instructional Systems,
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The present research investigated the extent to which users' perceived usefulness of IT was related to: (1) the user involvement in its design and implementation; (2) the user hierarchical position in the organization; (3) user years of service in the bank; and (4) user years of experience in banking business. In addition, the researcher examined the differences between males and females regarding the user involvement in design, involvement in implementation, and perception of usefulness of Information Technology (IT). The fifty-two bank users who participated in the study were volunteers from a major bank in the State of Mississippi. Seven research questions guided the study. Literature review on the user involvement in the design and implementation of IT system and their perceived usefulness of the system is inconclusive. Some research findings showed that users perceived the information technology as more useful when they were involved in the design and implementation phases of System Development Life Cycle (SDLC).

However, there were some research findings that showed that user involvement was not related to the perceived usefulness of IT.

The results of this study indicated that there were relationship between users' involvement in the design of IT and their perceived usefulness; it appears that when bank users were involved in the design of IT system, they were more likely to perceive the system as useful. However, the findings showed that there was no relationship between users involvement in the implementation and the perception of usefulness of the information technology system. The results also showed that there was a correlation between users' hierarchical position and their perceived usefulness of the IT system. This could mean that users who occupy high hierarchical position tend to perceive IT as more useful than those on the lower side of the hierarchy. The results also showed that users with more years of service in the bank regard the IT system as more useful than those who have less years of service in the bank. It appears that users with long service in the bank regard the system as more useful than those who have less years of service in the bank. The results also showed that users with more years of experience in the banking business regard the IT system as more useful than those who have less years of experience in the banking business. It appears that users with long years of experience in the banking business regard the IT system as more useful than those who have less years of experience in the banking business. The findings also demonstrated that there were no gender differences regarding involvement in design, involvement in implementation, and perception of usefulness of the IT system.

DEDICATION

Dedicated to my 3 daughters –

Sumaya, Sarah, and Suehyla

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TABLE OF CONTENTS

CHAPTER Page

APPENDIX

LIST OF TABLES

TABLE Page

LIST OF FIGURES

CHAPTER I

INTRODUCTION

Since the late 1970s, the cumulative development and progress in information technology (IT) have led to the propagation of computer operation, application and diffusion. Computers and auxiliary hardware and software are installed daily in industries, and educational institutions all over the globe. Every administrative and managerial level depends profoundly on the speed and efficiency of these electronic devices for the achievement of various daily activities (Kim, 1988; McKinney et al., 2002; Rapp, 2002). To understand information technology, the researcher will clarify first the word information in the context of commercial organizations.

Background

Information is classified data that identify a given phenomenon, circumstance, or state of affairs that help individuals and organizations in the decision-making process (Hordeski, 1990; Robertson, 1987). Put differently, information is "data that have been converted into a meaningful and useful context for specific end users" (O'Brien, 2004, p.13). The role of information in organizations has been changed due to three developments. Firstly, as a result of population and market growth that compels organizations to accumulate more highly detailed information needed for servicing organizational goals. Secondly, the proliferation of information technologies that capture,

store, process, and transmit data extended the scope of information collection and greatly increased the speed and range at which information might be created, disseminated and utilized. Thirdly, the final and perhaps the most significant development was that organizations began to learn how to deal with the information surge through techniques of information processing (Auster & Choo, 1996, p.3; O'Brien, 2004, p.4). Currently, information is considered as essential as any production factor, namely, land, labor or capital. On the other hand, organizations have realized that the planned, skillful use of information can lead to significant betterments in "performance and profitability" (Auster & Choo, 1996, p. 3; O'Brien, 2004, p. 59). It goes without saying that the inherent characteristics of information are unique in a way making it different from any other economic element. Accordingly, utilization of information by organizations as a "strategic" element requires a new pattern of information management. Ideally and manageably, information is to be tackled at several levels, "information as content (facts, ideas, knowledge, experience); information as tools (databases, files, libraries, repositories); and information as processes (information needs, information seeking, and use)" (Auster & Choo, 1996, p.3).

Avison (2002, p. 8) pointed out that as information is becoming more seen and recognized as a common contrivance, it becomes easier to obtain from "databases, data warehouses and the like." As a result, much interest has turned to "knowledge management." And although "knowledge is difficult to define … it can be seen as information plus intelligence (Avison, 2002, p.8). This leads to new capabilities and provides us with extra value to information" (Avison, 2002, p. 8).

Auster and Choo (1996, pp. 3-4) indicated that effective management of information requires "a holistic understanding of how organizations behave as information-seeking, information-creating, and information-using systems." We need to understand how organizations manage various information processing and work together toward the same goals and objectives of the organization. Organizational information research stems from, at least, two related sources: (1) "organization theory" and (2) "management theory and information systems" (Auster & Choo, 1996, p.4). The concern in this study is mostly in the second lineage, i.e., management theory and information systems. The reviewed literature integrates information and organizational theory in terms of: "management of information systems, management of information technology" (Auster & Choo, 1996, pp. viii-xi), and "organizations as information-processing systems" (Choo, 1996, p. 12).

These developments present major tasks for the concerned managerial authorities that shoulder the responsibility of acquiring a workforce that possesses the required technological knowledge and skills needed by their organizations to compete in a global economy. The following issues relate to this matter: organizational characteristics, task characteristics, interpersonal characteristics, and management information system (MIS) policies (Zmud, 1979).

Naisbitt (1982) painted the picture of the future American society by a ten-chapter book dealing with what he called the10-mega trends surrounding the pronounced shift of our society from an industrial society to an information society. The latter is a society the economy of which is erected on the production, distribution, and usage of information.

Today, the majority of workers are actually creating, using or distributing information rather than manufacturing products. “Indeed, many companies exist only to manufacture or transport information – overnight mail, computer service bureau, and consulting firms – and information technology – computer and software” (Naisbitt, 1982). A summary of Naisbitt’s 10-mega trends is given in Chapter II, “Review of Literature.” The underlying conclusion is that the information services sector paces the economy (Naisbitt, 1982).

As a result, researchers, prospective managers, business professionals, and academics started researching the concept of information systems/information technology. These groups of people who are concerned with information technology become aware of the problems and opportunities presented by the use of information technology and learn how to effectively confront such managerial challenges (O’Brien, 2004, pp. 7-8).

The concept of information technology success is widely acknowledged in the information technology literature. Theorists, however, are grappling with the question of which constructs best represent information technology success (Edstrom, 1977; Franz & Robey, 1986; Ives & Olson, 1984; Lucas, 1978a; Swanson, 1974; Zmud, 1979). The problem lies in the definition of success. It is a challenge for managers and professionals to develop successful information systems. “The success of information (technology) should not be measured only by its efficiency in terms of minimizing costs, time, and the use of information resources. Success should also be measured by the effectiveness of information technology in supporting an organization’s business strategies, enhancing its

organizational structure and culture, and increasing the customer and business value of the enterprise" (O'Brien, 2004, p. 27). Judging the success of information technology by measuring the satisfaction of the user is an approach that is used in a multitude of researches (Bjorn-Anderson & Hedberg, 1977; Bogler & Somech, 2005; Boland, 1978; Edstrom, 1977; Lucas, 1978a; Short, 1994; Short et al., 1994; Swanson, 1974).

It is expected that as information systems technology advances, the number of users will increase. These users are white-collar workers whose numbers are continuously increasing from one population census to another. They earn their living by creating, processing, using, and exchanging information instead of producing tangible goods and have been described as "knowledge workers" (Whitten & Bentley, 1986) and "gold collar" workers (Newell et al., 2002), representing at least 60 percent of today's workers. Definitely, the productivity of knowledge workers depends on their familiarity and satisfaction with the information system (IS) in which they are involved.

This study will utilize Whitten's four classifications of knowledge workers (Whitten & Bentley, 1986), namely, clericals, supervisors, middle managers and professionals, and executive management. "User involvement" is the second variable in the study and is defined as the participation in the system development process by representatives of the target user groups (Ives & Olson, 1984). User involvement in the development of computer-based information systems is enthusiastically endorsed as reflected by the literature reviewed in Chapter II.

The reviewed literature indicates that there is almost general agreement that the success of information systems can be improved by involving the user in the development of those information systems (Bailey and Pearson, 1983; Bally et al.,1977; Bjorn-Anderson & Hedberg, 1977; Bogler & Somech, 2005; Boland, 1978; Edstrom, 1977; Ein-Dor and Seveg, 1982; Lucas, 1978a; Swanson, 1974). However, not all conclusions support this argument consistently, a fact which might be related to problems in research design, instrumentation and/or data analysis (Davis, 1982; Gorry and Morton, 1989).

Franz and Robey (1986) investigated the relationship between user involvement in information system development and perceived system usefulness. The study resulted in a modest support for the statement that user involvement increases the perception of usefulness of information systems. The authors used nine organizational factors as "moderator variables," which they conceptualized as components of three major organizational categories as follows (Franz & Robey, 1986, p. 331):

"Nature of decision making: level in organization; structure of decisions

"Organizational characteristics: size; age; decentralization

"MIS departmental characteristics: size of department; age of department; level of department; scope of department."

Statement of the Problem

The result of the change and advancement in technology has impelled managers and administrators to pay careful attention to the definition and impact of IT in the workplace. The rapid pace of development and change in technology necessitates the

involvement of users in the processes of inception, acquisition, implementation and integration of any added technology. The global role of IT in advanced societies makes it critical to their continuing progress. It is no wonder that the factors generating the largest portion of research activity have involved the user influence on IT success. IT has made the work environment more dynamic and increasingly complex. Despite the funds spent by both federal and state governments on promoting instructional technology in the classroom, a company's managerial "strategy" renders the gained knowledge in the classroom obsolete and calls for training its own knowledge working force (Rapp, 2002, p. 27). For example, the federal government spent the following (Romano, 2003, p.3):

- $7.95 billion from 1998 to 2002 to connect classrooms to the Internet.
- $14.1 billion from 1958 to 1995 for programs promoting the use of educational technology (ET).
- In addition, $5.7 billion spent by states on ET in the fiscal year (FY) of 2000.

Identification of the user position in the hierarchy of the organization within which the investigated information system (IS) is implemented will shed light on the relationship between user involvement and perception of usefulness. Therefore, this study investigates the relationship between the user involvement in the design and implementation of information technology (IT) and the perceived usefulness of that technology. It also explores the extent to which the user hierarchical position in the organization relates to the user involvement and perceived system usefulness. Furthermore, this study investigates the relationships between the user involvement in the

design, implementation, and perception of usefulness of IT and years of service with the bank and in the banking business.

Research Questions

The researcher developed the following research questions to guide the study:

1. Does a relationship exist between the user involvement in the design and implementation of IT and the perceived usefulness of the system?
2. Does a relationship exist between the user hierarchical position and his/her involvement in the design and implementation of IT?
3. Does a relationship exist between the user hierarchical position and his/her perceived usefulness of IT?
4. Does a difference exist between males and females regarding the user involvement in the design and in the implementation of IT?
5. Does a difference exist between males and females regarding the user perceived usefulness of IT?
6. Does a relationship exist between the user involvement in the design, implementation, and perception of usefulness of IT and years of service in the bank?
7. Does a relationship exist between the user involvement in the design, implementation, and perception of usefulness of IT and years of experience in the banking business?

Justification for the Study

It has been mentioned above that one of the most noteworthy developments in the contemporary world is the rapidly expanding pervasive role of information technology (IT) in successful global firms. Until 1890, the daily business activities of the commercial banks were done manually with "pen and ink" as the main technology. The bank of America was the "first bank to install a computer … at San Francisco" in 1955 (O'Brien, 1968, p. 2). Today, computers and IT are the backbone of commercial banks in the "cashless-checkless society" (O'Brien, 1968, p.27).

In the past, business executives dared to delegate, ignore or avoid IT decisions. Today such practices become impossible to follow in most businesses and industries (Peterson, 2004, pp. 38-39). In fact, dependency on IT has become even more imperative in our knowledge-based economy, where organizations are using technology in managing, developing and communicating intangible assets such as information and knowledge (Patel, 2004, pp. 81-97).

The essential idea is that, in the global knowledge economy, the survival and development of business and industry commands the concerned executives and managers to initiate effective tactics and to survive in an ever-changing competitive environment. Such stratagem requires a disciplined strategic planning and effective approach couched in information in order to be able to discover, understand and apply new knowledge and ideas. To do this, managers and executives must have an IT infrastructure and a work climate that enable concerned employees to handle work issues intelligibly and competitively, hence increasing productivity. This calls for the so called "prepared mind"

which requires a clear understanding of the changing ways in which knowledge is creating global economy (Garvey & Williamson, 2002).

Amidst the challenges and changes of the 20th and 21st centuries is the technology revolution that is attached to information to become IT. Information Technology is changing the way activities in the contemporary world operate. Organizations, their managers and employees must cope with and adapt to the new environment. Success of IT becomes essential to business only if it enables the establishment to combat a fair share of prevailed competition. Among the multitude of factors that influence IT success is the user satisfaction with the system (Auster and Choo, 1996).

User satisfaction is an important area of IT research because it is considered a significant factor in measuring IT success and use (DeLone & McLean, 1992; Doll & Torkzadeh, 1988; Doll et al., 1994; Ives & Olson, 1984; Seddon, 1997). Hence the researcher's expectation is to further the knowledge about factors that influence the success of IT. Specifically, the author will investigate user involvement in the design and implementation of the information system (IS) and its impact on the perception of usefulness (success).

Delimitations of the Study

This research was undertaken with the objectives to find answers for specific questions that were systematically formulated from the possible literature available on IT. The author's selection of a commercial bank to answer the stated research questions has been stimulated by the fact that these establishments have been pioneers in the use of

computers and electronic data processing (EDP). Due to time limitations and research costs, the studied bank was chosen because of its accessibility to the author, since frequent personal contacts with bank personnel were necessary for the success of the research. Moreover, this bank expressed willingness to cooperate with the author in this undertaking. On the other hand, it must be indicated that this bank claims no responsibility for this study.

Limitations of the Study

It must be indicated that the results of this study cannot be claimed to be statistically representative of the entire banking industry and cannot be generalized beyond the studied bank. In addition to what has been said, the following factors also limit the study:

1. The uniqueness of banking industries in general and commercial banks in particular.
2. The particular location of the bank studied.
3. The number of users who responded to the questionnaire.
4. The specific work environmental culture of the users.

One must indicate, however, that the aforementioned limitations must not devalue the objectives of the study. Even though the research is limited to one bank, the obtained results are expected to contribute to the existing knowledge on IT.

Definition of Terms

The present study uses a set of terms that are defined as follows:

Information technology (IT) - In this study the following terms are used interchangeably to refer to IT: "information system (IS)," "computer systems (CS)," and "management information system (MIS)." Rapp (2002, p. 25) states that "the role of IT is to enable the user to do better what already is done well."

Information system (IS) - O'Brien (2004, p. 7) defines an IS to be "any organized combination of people, hardware, software, communications networks, and data resources that collects, transforms, and disseminates information in an organization."

Users - In this study the term users refers to members of the organization's workforce that utilize IT to execute skillfully daily work tasks in manners that fulfill objectives of the firm. For O'Brien (2004), users are also called "end users or clients" whom he considers to be:

> People who use an information system or the information it produces. They can be customers, salespersons, engineers, clerks, accountants, or managers. Most of us are information system end users. And most end users in business are knowledge workers, that is, people who spend most of their time communicating and collaborating in teams and workgroups and creating, using, and distributing information. (p. 11)

Rapp (2002, pp. 21-25) delineates three strategic levels of IT, which are determined by the functional ability of the firm. "Level 1 firms" use generally "packaged" IT for simple functions tasks. Such technologies are of types that "are available to any high school or college student." Firms of "Level 2 and Level 3" consider IT essential for "their corporate strategies and competitive success." The difference

between Level 2 and Level 3 firms lies in the ability in Level 3 to create customized IT that cannot be emulated and the "managers are IT – and strategically fluent."

Management information system (MIS) - This concept was developed as an information support system "that focused on developing business applications that provided managerial end users with predefined management reports that would give managers the information they needed for decision-making purposes" (O'Brien, 2004, p. 21). Later, this concept was scrutinized and its efficiency increased to provide "managerial end users" with management information adequate for "decision-making needs" resulting in so called "decision support systems" (DSS). This latter concept was developed later into "executive information systems (EIS)" to provide "top executives with the critical information they want" (O'Brien, 2004, p. 21).

Acquisition - The first step undertaken by an organization to "evaluate … necessary hardware and software resources and information system services" (O'Brien, 2004, p. 369).

Design - Webster's New Collegiate Dictionary (1977, p. 308) provides several definitions to the word design of which the following are the most relevant: (1) "a mental project or scheme in which means to an end are laid down," (2) "a preliminary sketch or outline showing the main features of something to be executed," (3) "the arrangement of elements that go into human production." Accordingly, for the purpose of this study one may define the word design as a blueprint that takes into consideration what satisfies the users and fulfills the ends of all other concerned officials. For example, Shelly et al.

(2003, p. 24) indicated that in the "systems design phase" the objective is to "create a blueprint that will satisfy all documented requirements for the system."

Implementation - A "process that carries out the plans for changes in business/IT strategies and applications that were developed in the planning process" of the organization (O'Brien, 2004, p. 324). Individual acceptance of IT is "a crucial (problem) for those responsible for implementing technologies." (Agarwal, 2000, p. 86).

Acceptance - Acceptance is "the act of adopting the information technology, that is, the initial decision to use it or not" (Agarwal, 2000, p. 86). Acceptance can go further to connote other meanings associated with a given IT "such as improved work performance, enhanced productivity, and user satisfaction. … Acceptance behavior is … influenced by a variety of factors, including individual differences, social influences, beliefs and attitudes, situational influences, and managerial interventions" (Agarwal, 2000, p. 87).

Success - With regard to IT, "an information system" is successful if it is both efficient "in terms of minimizing costs, time, and the use of information resources" and effective "in supporting an organization's business strategies, enabling its business processes, enhancing its organizational structures and culture, and increasing the customer and business value of the enterprise" (O'Brien, 2004, pp. 26-27).

Number of years of Service in the bank (NYSB) – The number of years spent working for the bank that the researcher investigated in the study.

Number of years of experience in banking business (NYEBB) – The number of years the user spent working for this bank as well as other banks.

CHAPTER II

REVIEW OF THE LITERATURE

This chapter contains a review of the literature relevant to this study. The review will be classified into four major categories: (1) information and technology era; (2) classification of knowledge workers; (3) user involvement; and (4) perceived usefulness or success of information technology (IT).

Information and Technology Era

The flow of information technology (IT) in industrial societies has transformed these societies into technology dependent societies. Day-to-day business in the contemporary world cannot function efficiently without IT (White, 2004; Van Grembergen et al., 2004; Peterson, 2004). In the 21st century, business is confronted with "a global digital revolution" that makes ignoring or avoiding IT a catastrophic decision (Peterson, 2004, p. 38). In Peterson's own words (2004, p. 38) "Boards and business executives… today cannot conduct marketing, R&D or HR without depending on IT at some point in time. Metaphorically, a 'Speak-See-Hear No Evil' attitude towards IT Governance is no longer viable in today's business landscape." Others advocate that IT "has the potential to dramatically change the way we work and live (Andrews and Johnson, 2002, p. XVII).

Since the Industrial Revolution, society has been transforming in stages from industrial societies to post-industrial societies, and lately, to so called information societies (Naisbitt, 1982, p. 11). This change led to a significant shift in the occupational structure that resulted from the creation of new occupations and the disappearance of others (Blau & Duncan, 1967; Hall, 1994; Kalleberg & Berg, 1987). These developments in the occupational structure have led to the introduction of new occupational titles. Naisbitt (1982) painted the picture of the future American society by a ten-chapter book dealing with what he called the10-mega trends surrounding the profound shift of our society from an industrial society to an information society. The latter is a society the economy of which is erected on the production, distribution, and usage of information. A summary of Naisbitt's 10-mega trends (1982) follows:

> (1) Although we … live in an industrial society, we have changed to an economy based on the creation and distribution of information. (2) We are moving in the dual directions of high tech/high touch, matching each new technology with a compensatory human response. (3) No longer do we have the luxury of operating within an isolated, self-sufficient, national economic system; we … are part of a global economy. .. the United States … must (not) remain the world's industrial leader as we move on … (4) We are restructuring from a society run by short-term considerations and rewards in favor of … much longer-term time and frames. (5) In cities and states, …, we have rediscovered the ability to act … and achieve results – from bottom up. (6) We are shifting from institutional help to more self-reliance in all aspects of life. (7) … the framework of representative democracy has become obsolete in an era of instantaneously shared information. (8) We are giving up our dependence on hierarchical structures in favor of informal networks. … (9) More Americans are living in the South and West, leaving behind the old industrial cities of the North. (10) … we are exploding into a free wheeling multiple-opinion society. (pp. 1-2)
> The underlying conclusion of these trends is that the information services sector paces the economy. (Naisbitt, 1982)

The Notion of Knowledge Workers

The diffusion of technology in American society has transformed the occupational structure of its workforce through the creation of so called knowledge workers. For the purpose of this study, one needs to define "knowledge" and "knowledge work." This task is undertaken below.

Knowledge

Knowledge "is the way in which information is conveyed and the meaning that the individual infers from the information" (Newell et al., 2002, p. 3). Another definition perceives knowledge to refer to "factual propositions and understanding" (Calderhead, 1996, p. 715, as cited in Ertmer, 2005, p. 28). In practice, however, it is difficult to define knowledge due to the type of knowledge per se. Knowledge can be "tacit," or "explicit." Tacit knowledge is something that is implicitly known but wordlessly articulated. It is often "referred to as 'know-how'" (Newell et al., 2002, p. 3). Rapp (2002, p. 11) defines "Tacit knowledge (as) a way of knowing and understanding something independently of its specific context." "Explicit knowledge" is something that "can be readily codified and communicated to others" (Newell et al., 2002, p. 4).

Knowledge Work and Knowledge Workers

The consequences of the advances in science and industries in the American society during the twentieth century have resulted in significant changes in the ccupational structure, and the introduction of a multitude of new occupational titles. The

conception of "knowledge workers" is one of these terms. Newell et al. (2002, p. x) indicated that although "knowledge workers are indeed similar to professional groups in … the significant … autonomy in their work … the professional model seems increasingly strained by a series of developments in advanced economies which seem to demand a more inclusive account of the way in which knowledge is applied to work."

O'Brien (2004, p. 11) advocates that most end users of IT "in business are knowledge workers, that is, people who spend most of their time communicating, and collaborating in teams and workgroups". Today, the majority of workers are actually creating, using, or distributing information rather than manufacturing products or rendering services. Indeed, many companies exist only to manufacture or transport information (i.e., overnight mail, computer service bureau, and consulting firms) and information technology (i.e., computers and software). Today, the information services sector paces the economy (Whitten & Bentley, 1986).

In researching the "status quo" of the impact of IT on the "human and structural" changes in the "workplace," Brooke (2002, p. 114) referred to three concepts, namely, "automate, informate, and transform" as "the different ways in which technology could (affect) business processes." Brooke (2002, p.115) cited Cash et al. (1994) as "a best useful guide" to expand on the implication: "When information technology substitutes for human effort, it automates a task or process. When information technology augments human effort, it informates a task or process. When information technology restructures, it transforms a set of tasks or processes."

Naisbitt (1982) pointed out that "the change to an information society was so subtle that most people did not even notice." For Naisbitt, it began in 1956, when white-collar workers first outnumbered their blue-collar counterparts. The broad occupational categories in Table 2.1 are based on the social classification of occupations as given in

Table 2.1 Employment for the United States in 1950 and 2000 by Broad Occupational Groups

Major Occupational Group	Number Employed			Percentage		
			Change	Distribution		Change
	1950	2000	1950-2000	1950	2000	1950-2000
White collar	21,097,043	78,268,121	57,171,078	37.38	60.34	270.99
Prof., etc.	4,986,922	26,198,693	21,211,771	8.84	20.20	425.35
Blue-collar	22,736,368	31,224,634	8,488,266	40.29	24.07	37.33
Service	5,784,325	19,276,947	13,492,622	10.25	14.86	233.26
Farm , etc.	6,817,537	951,810	- 5,865,727	12.08	0.73	-86.04
Total	56,435,273*	129,721,512	73,286,239	100.00	100.00	129.86

* The "not stated" category (742,933) is redistributed proportionately.

Source: Data are compiled and computed from: for 1950, U.S. Bureau of the Census, U.S. Census of Population: 1960. Detailed Characteristics. United States Summary. Final Report PC(1)-1D. Table 202, pp. 528-533. U.S. Government Printing Office, Washington, D.C., 1963. Data for 2000 are compiled and computed from U.S. Census Bureau, *Census 2000.* Retrieved March 6, 2006, from www.census.gov/prod/cen2000/doc/sf3.pdf

Hall (1969 & 1994). The groupings were collapsed from data on occupational classifications given in the decennial population censuses of the United States (U.S. Bureau of the Census, 1963) as follows:

1. White-collar workers include: (a) professional, technical, and related workers; (b) managerial, executive and related workers; (c) clerical workers; and (d) sales workers.
2. Blue-collar workers include: (a) craftsmen, operatives, foremen, and related workers; and (b) non-farm laborers and related workers.
3. Service workers include: private household workers and other service workers.
4. Farm laborers.

By analogy, to view the involvement of this occupational structure in the economy of the United States, Table 2.2 provides the three basic sectors of the economy, namely, the primary, secondary, and tertiary sectors. These broad sectors were aggregated from the U.S. decennial population censuses as follows:

1. The primary sector constitutes agriculture, forestry, fishing, mining, quarrying, and any similar activities involving the gathering or extracting of raw natural resources.
2. The secondary sector constitutes those activities that turn the material produced by the primary sector into manufactured commodities.
3. The tertiary sector constitutes all service activities.

Technological development and industrial growth are major sources of occupational change (Bell, 1973; Blau & Duncan, 1967; Hall, 1969). Tables 2.1 and 2.2 quantify the changes in the composition of occupations and industries of employed persons as reported in the United States decennial population censuses of 1950 and 2000. Table 2.1 indicates that while total employment in the United States increased by roughly 130 percent between 1950 and 2000, the growth of white-collar employment was more than two-fold (271 percent) the increase in the total employment. The professional group (a sub-category of white-collars) increased by 425 percent. In the meantime, the share of white-collar workers employed in the United States employment increased from 37.4 percent in 1950 to 60.3 percent in 2000. In contrast, the share of blue-collar workers decreased from 40.3 percent in 1950 to 24.1 percent in 2000. This trend is supported by the data in Table 2.2.

Table 2.2 gives the employment in the United States by the industry sector for 1950 and 2000. Table 2.2 indicates that the primary sector lost roughly 70 percent of its employment between 1950 and 2000. In the meantime, the professional segment (which includes knowledge workers) in the tertiary sector increased its employment by 855 percent between 1950 and 2000, and its proportional shares in the two censuses increased from roughly 9 to 32 percent in 1950 and 2000, respectively.

Table 2.2 Employment in the United States: 1950 and 2000 by Industry Sector

Major Industry Sector	Number Employed 1950	2000	Change 1950-2000	Percentage Distribution 1950	2000	Change 1950-2000
Primary	8,085,388	2,426,053	-5,659,335	14.33	1.87	-69.99
Secondary	18,418,678	27,087,512	8,668,834	32.64	20.88	47.07
Tertiary	29,931,207	100,207,947	70,276,740	53.04	77.25	234.79
Prof. etc.	4,899,775	41,901,458	37,001,683	8.68	32.30	855.17
Total	56,435,273*	129,721,512	73,286,239	100.00	100.00	129.86

*The "not stated" category (742,933) is redistributed proportionately.

Source: Data are compiled and computed from: for 1950, U.S. Bureau of the Census, U.S. Census of Population: 1960. Detailed Characteristics. United States Summary. Final Report PC (1)-1D. Table 211, pp. 565-566. U.S. Government Printing Office, Washington, D.C. 1963. Data for 2000, are compiled and computed from U.S. Census Bureau, *Census 2000.* Retrieved March 6, 2006, from www.census.gov/prod/cen2000/doc /sf3.pdf

Every task requires knowledge for its proper performance. Garvey and Williamson (2002, p. 51) advocated that in increasing their "economic appeal," employees are tempted to increase the "power of (their) knowledge productivity" which arises from "the perceived need to work, design, and learn together." Proliferation of information technology (IT) has required an increase in knowledge management (KM), the aim of which is to articulate the available knowledge and channel it to its targets. As a term, "'knowledge work'" refers to "specific occupations that are 'characterized by an

emphasis on theoretical knowledge, creativity and use of analytical and social skills'" (Frankel et al., 1995, p. 773, as cited in Newell et al., 2002, p.18). According to this definition, knowledge work constitutes those occupations that are reported in the decennial population censuses of the United States in the category entitled "professional, technical, and kindred workers." These workers are called "knowledge workers" (KWs) (Newell et al., 2002, p. 18). Naisbitt (1982, p. 15) states "Professional workers are almost all information workers—lawyers, teachers, engineers, computer programmers, system analysts, doctors, …" The information or knowledge workers are the "overwhelming majority of service workers (who) are … engaged in the creation, processing, and distribution of information (Naisbitt, 1982, p. 14). The question now is how to improve the productivity of knowledge workers who depend on information because better information will lead to better decisions. Certainly, it is useful for every legitimate business to know the characteristics and responsibilities of the different knowledge workers employed in the business. Ignoring a person working knowledge results in a "mechanistic" approach that makes the worker "a cog in a machine" (Figallo & Rhine, 2002, p. xvi). This occurred when the assembly line was introduced to generate mass production, "whether the end products were automobiles, shoes, or documents (Figallo & Rhine, 2002, p. 21). An example from the automobiles industry in Japan (Rapp, 2002, p.33) indicates how Toyota Motor Corporation preferred to customize most of its own information technology (IT) rather than adopting the entire integrated software systems sold by ASP (one of the world's largest and specialized firms in software).

Toyota acquired only those pieces of SAP's system which those in Toyota considered to "be useful, and which could be adapted to their existing … systems more cost effectively and quickly than developing in-house programs." A major reason indicates the considerations Toyota has given to their concerned workforce since Toyota's system has been "developed over many years … involve(s) hundreds of million of code… complex and tightly integrated with (the) organization" in a way that the acquired "software packages … cannot replicate the benefits and functionality" of the current system.

Ignoring workers' abilities resulted in "deskilling" where workers' ability became limited "to perform more specialized tasks requiring less subtlety, less training, less knowledge, and less creativity" (Figallo & Rhine, 2002, p. 20). Realizing that worker knowledge is the worst thing to ignore, those concerned with productivity of workers in the "information age" began to care for their proper treatment.

Garvey and Williamson (2002, p. 126) have raised a number of questions, about maintaining "expertise" and continuing "learning" in organizations, among which is the following question: "How far do the organizations of which people are a part encourage them to take up new learning opportunities?" They have indicated that these learning opportunities and ways of learning are a function of differentiation in "social class, gender, age and, race," and that elimination of such differentiation is a function of "modern economies" (Garvey & Williamson, 2002, p. 127). Accordingly, it is imperative to seek employees' in-put in introducing any IT or change of their working environment,

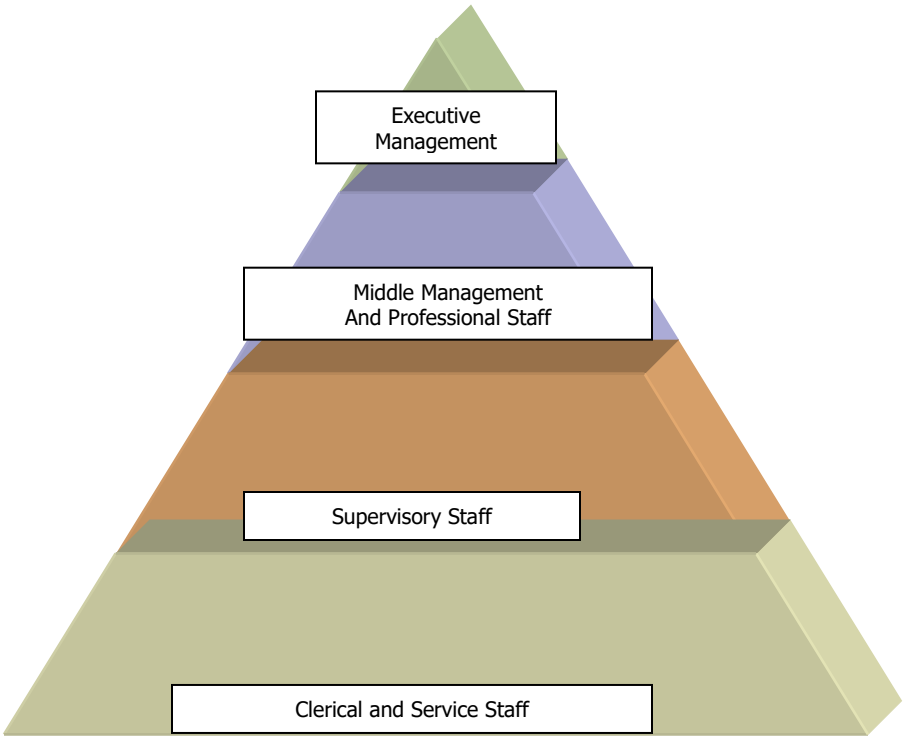
since a “Change for the sake of change is often counterproductive” (Figallo & Rhine, 2002, p. xviii).

Figure 2.1 shows knowledge workers’ dimensions within the information system. These categories of knowledge workers should be identified in the organization. Until recently, knowledge workers were content to let data processing professionals develop computer applications. Figure 2.2 maps knowledge workers hierarchy into decisions and information needed at every level.

Nature of Commercial Banks

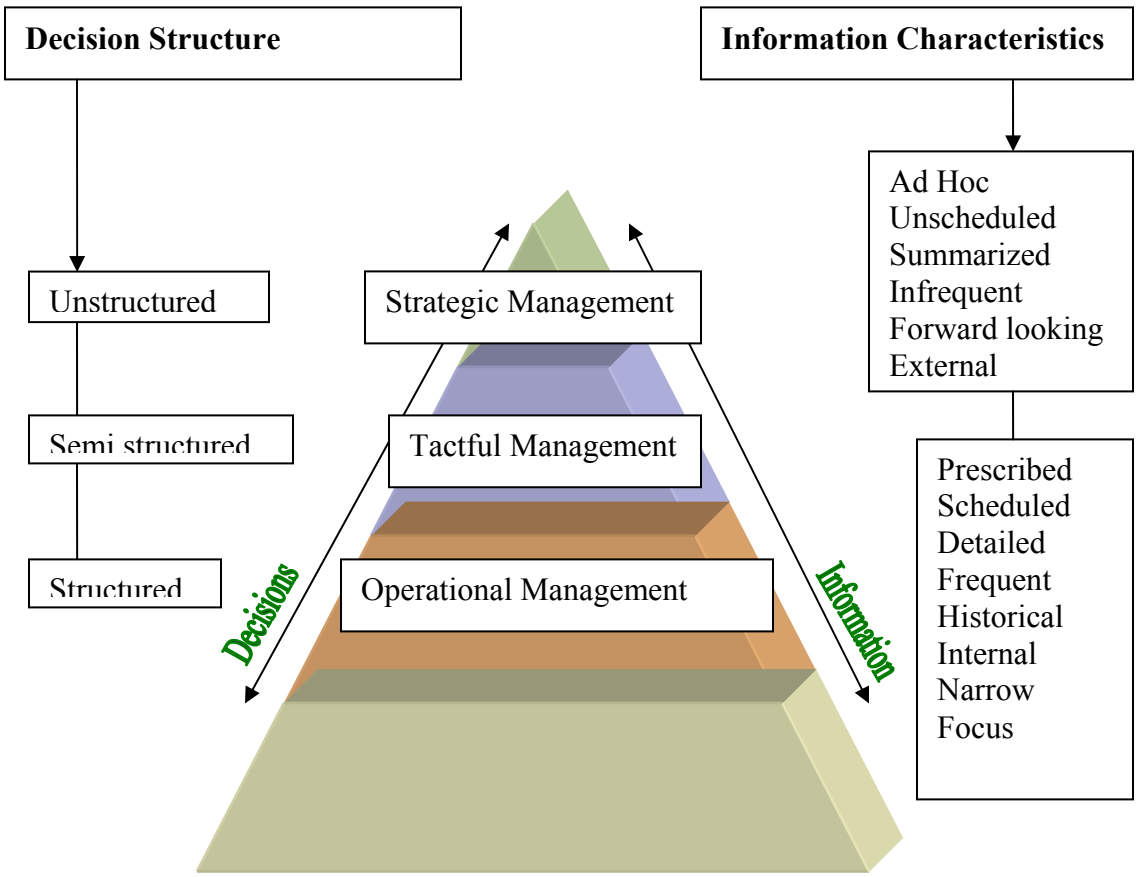
For the purpose of this research, the researcher defines commercial banks as formal organizations, the functional structure of which is rationalized and oriented toward the maximization of profit and minimization of cost through efficiency and specialization in providing a monetary service to their communities. Identification of the types of banks with respect to the present study is essential since “different types of technologies (are) associated with different forms of organizations” (Newell et al., 2002, p. 95). It is this functional differentiation in organizations that makes “firms (adopt) different strategic choices about information technology infrastructure capability” (Weill & Broadbent, 2000, p. 330). Among the examples given, Weill and Broadbent (2000, p. 330) cite the one given by (Neo & Soh, 1995) as follows:

> Citibank Asia is centralizing and standardizing all back-office information technology processes into one location for all of its Asian country operations, while its parent company, Citicorp, is forging ahead with higher levels of centralized and standardized infrastructure services throughout its world operations.



Source: Whitten & Bentley, 1986.

Figure 2.1 Knowledge Workers Dimensions of the Information System



Source: O'Brien, 2004.

Figure 2.2 Information System Requirements for Decision Making

Avoiding specification of research units when dealing with information technology (IT) may result in partial attainment of the research objective for a number of reasons. For example, certain assumptions that are considered to be realistic when formulated about the launching of a given IT turn out to be practically unrealistic. The following are examples of "unrealistic assumptions" as given by Andrews and Johnson (2002, p. 30):

1. The environment will remain stable during a launched project.
2. End users can define, in advance, exactly what will be needed.
3. Complex problems can be solved completely on the first attempt.
4. Requirements can be precisely defined before packaged software is selected.
5. Users will cheerfully accept changes in their work environment.

Moreover, IT in the United States, as in other industrial nations, is "applied within organizations for one purpose only: to carry out or enable a value-adding purpose" (Zmud, 2000, p. iv). As is the case with any business, banks implement IT to achieve a planned managerial objective. Specifically, IT is utilized "to support diverse strategic and operational objectives ranging from enabling competitive strategy, …, to performing routine operational tasks. In this context …, all knowledge workers in today's economy need to utilize IT as an integral component of accomplishing organizational work" (Agrawal, 2000, p. 85).

User Involvement

It is essential to indicate that, as knowledge workers, users of IT expect to be accorded special treatment. Examples of such treatment are: (Newell et al., 2002, pp. 27-28):

1. Considerable "autonomy" in their work.
2. Facilitation of free interaction with peers and immediate supervisors (Newell, et al., 2002, p. 28). In fact, the "social interaction itself, rather than the knowledge gained from the conversation, may be the prime focus" (Figallo & Rhine, 2002, p.124).
3. "Careful management" that suits their status as being called "'gold collar'" workers (Kelley, 1990, as cited in Newell et al., 2002, p. 28). The termed status calls for careful treatment of these workers by management by paying "attention to both the structural and cultural conditions that exist within the" work environment (Newell et al., 2002, p. 28).

Some authors (Mason & Mitroff, 1973) proposed categorization of users according to psychological traits as follows: (a) thinking-sensation, (b) thinking intuition, (c) feeling-sensation, and (d) feeling-intuition. In another study, Ives and Olson (1980) proposed a comprehensive framework for research in MIS within an organization. One of the environments in their study is the user environment, which is classified as follows:

(a) characteristics of the user, (b) characteristics of the user organization, and (c) characteristics of the user task.

Jenkins and Ricketts (1979) suggested classifications of users by demographic, psychological, and motivational attributes. Demographically, users can be classified according to (a) age, (b) education, (c) occupation, and (d) experience. Psychologically, a user can be categorized according to (a) intelligence, (b) aspiration level, (c) reliability, (d) risk-taking propensity, and (e) conceptual as well as other behavioral aspects. Motivationally, a user can be further classified according to goal specificity and rewards. Agarwal (2000) lists user differences as follows:

> (1) cognitive style represents the mode of functioning shown by an individual in his/her perceptual and thinking behavior. (2) personality refers to the cognitive and affective structures maintained by individuals to facilitate adjustments to events, people, and situations encountered. And (3) demographic situational variables refer to a broad spectrum of personal characteristics including intellectual abilities, domain-specific knowledge, sex, age, experience, education, professional orientation, and organizational level." (p. 95)

Edstrom (1977) distinguished between users and specialists at two different hierarchical levels in the organization. On the user side, he studied the influence of the functional manager, i.e., one whose task is most affected by the system, and the influence of the user subordinate to the functional manager, who is most directly affected by the system. If several subordinates were about equally affected, he chose the person most involved in the development process as a subject for his research. In Edstrom's words (1977):

> We believe that it is important to distinguish between users at different levels of the organization since a user at a higher level would have greater possibilities

> because of his status to change existing practices. We assume, therefore, … that the influence of the functional managers, especially during the early phases of the system-development process, will be positively related to the adoption of system designs that change the existing way of doing things. If the system-development process is conceived of as a process of interaction, user influence ought to be studied in relation to the influence of other key actors in the process. (p. 592)

In other words, it is not the inherent quality of a given IT per se that enhances the efficiency of organizational functions but the ability and satisfaction of the individuals using it. Put differently, "individual users … may completely reject it and engage in sabotage or active resistance, they may only partially utilize its practicability, or they may whole heartedly embrace the technology…" (Agarwal, 2000, p. 85). Other studies in IT (Andrews & Johnson, 2002; Newell et al., 2002) have advocated the analytical importance of the relationship between information and communication technologies and inter-organizational comparisons and organization forms.

Ives and Olson (1984) defined user involvement as the participation in the system development process by representatives of the target user group. They stated that the "common wisdom" of user involvement should lead to improved chances of successful system implementation can be traced to theory and research in organizational behavior, including group problem solving, interpersonal communication, and individual motivation.

User involvement in the development of computer-based information systems is fervently endorsed in the relevant literature. For example, it has been found that there is a long-standing considerable agreement between researchers and practitioners that user involvement is a key to the success of computer-based information system (Garrity,

1963; Higginson, 1965; Ives & Olson, 1984; Mckinsey, 1968; O'Brien, 2004; Orlicky, 1969; Peterson, 2004; Powers & Dickson, 1973; Rapp, 2002; Swanson, 1974; Vanlommel & De Barbander, 1975; Wixom & Todd, 2005; Zmud, 2000).

Ives and Olson (1984) reviewed the literature concerned with user involvement and system success. They pointed out that it is almost a maxim of the MIS relative literature that user involvement is a necessary condition for successful development of computer-based information system (CBIS). Their conclusion concerning research in user involvement was as follows:

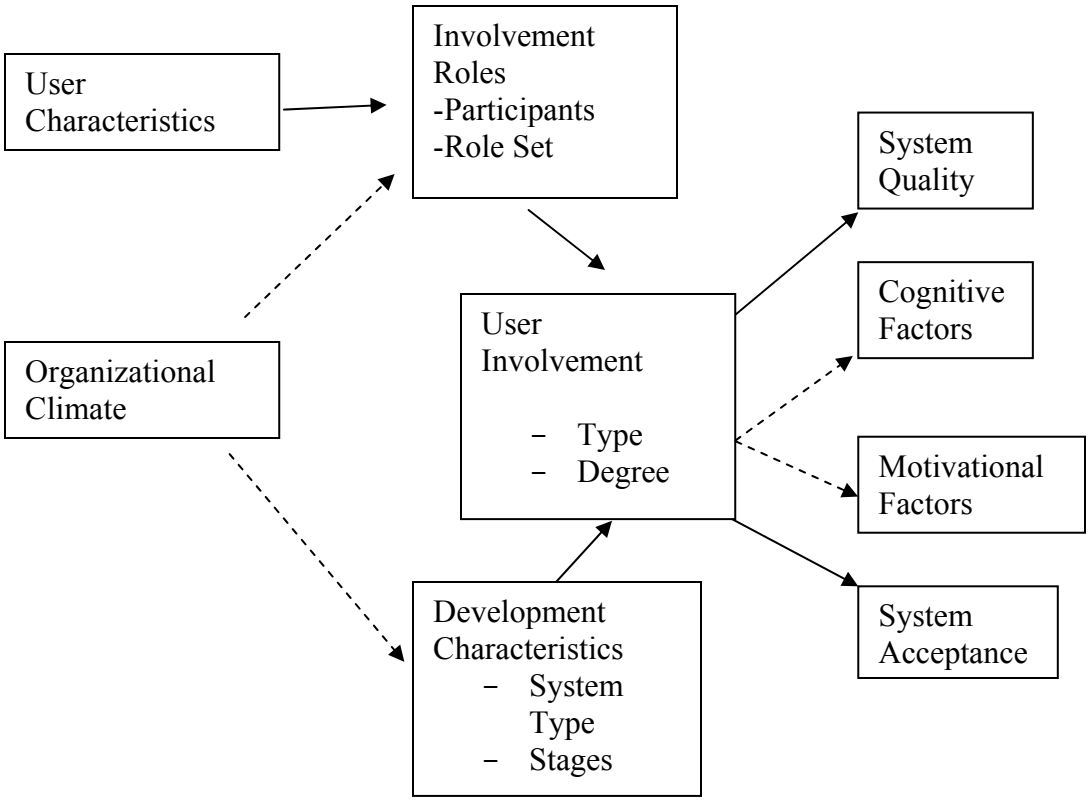
1. Empirical research has not convincingly demonstrated the benefits of user involvement.
2. The majority of studies on user involvement have been methodologically flawed to the extent that few conclusions can be made about user involvement's relationship to system success.

Ives and Olson's descriptive model (1984) of user involvement and its relationship to system success is presented in Figure 2.3. The model is derived partly from previous studies of user involvement and partly from research on participative decision-making and planned organizational change.

Other authors' claims ponder the following: "User participation is critical to the success of any MIS project" (Powers & Dickson, 1973, p. 156). Still others (Mahmood et al., 2000; Wixom & Todd, 2005) consider satisfaction with IT as an indicator of IT success. Viewed with other factors, e.g., "top management support, competence of EDP

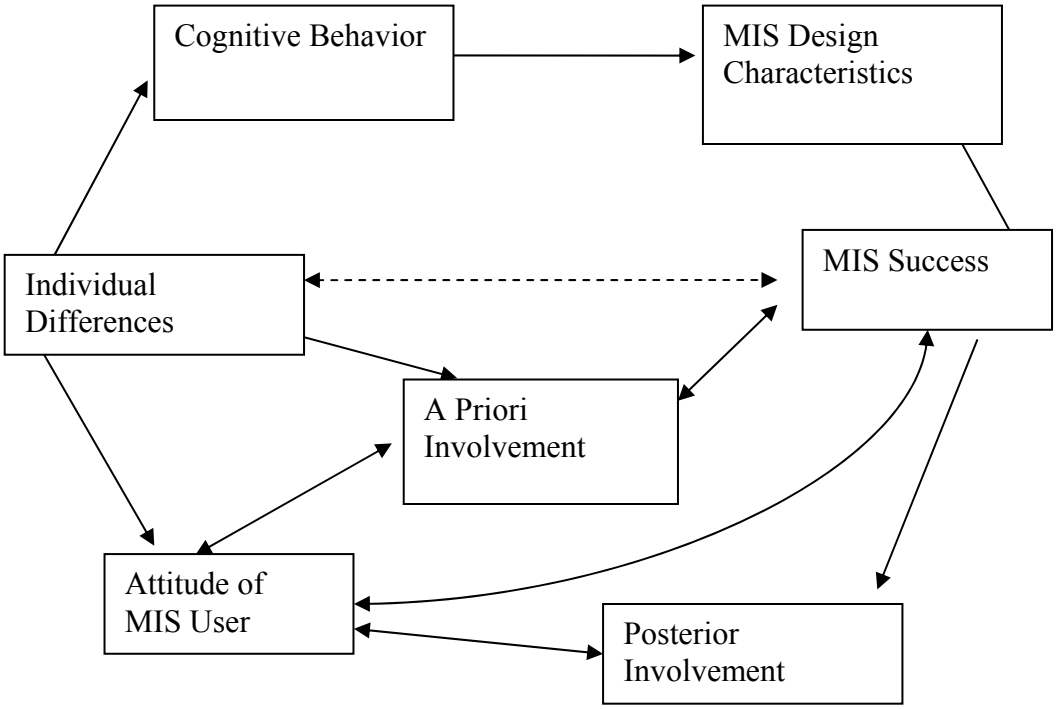
staff, quality of goal setting, user involvement seems to be the only one which is consistently related to the quality of final outcomes" (De Barbender & Edstrom, 1977, p. 191).

Even though user involvement can be expected to be generally beneficial, one still needs more variables in order to predict more precisely the impact of user involvement. Such variables should constitute more specific information about the type of user, involved user behavior, and the traits of the context in which the system is developed (Edstrom, 1977). Zmud (1979) presented a framework for research on individual differences and MIS success. His research framework portrayed the ways in which individual differences influence MIS success. As illustrated in Figure 2.4, two paths characterized as representing the cognitive and attitudinal influences of individual differences on MIS success are conceptualized. He further listed the possible sub-categories of each element of the framework based on theories developed by other researchers. Comparatively, another study concluded that “perception of information systems (IS) success” was related to “user satisfaction” and “technology acceptance” (Wixom & Todd, 2005, p. 85).



Source: Ives & Olson (1984).

Figure 2.3 A Descriptive Model of User Involvement.



Source: Zmud (1979).

Figure 2.4 Impact of individual differences upon MIS

User Involvement and Perceived System Usefulness

The review of management information system literature shows that there is almost general agreement that the success of information systems can be improved by involving the user in the development of those systems (Bjorn-Anderson & Hedberg, 1977; Boland, 1978; Edstrom, 1977; Lucas, 1978a; Swanson, 1974). However, not all empirical studies support this general normative argument consistently (Ives & Olson, 1984; Olson & Ives, 1981). This discrepancy could be related to faults in research design, instrumentation and/or data analysis.

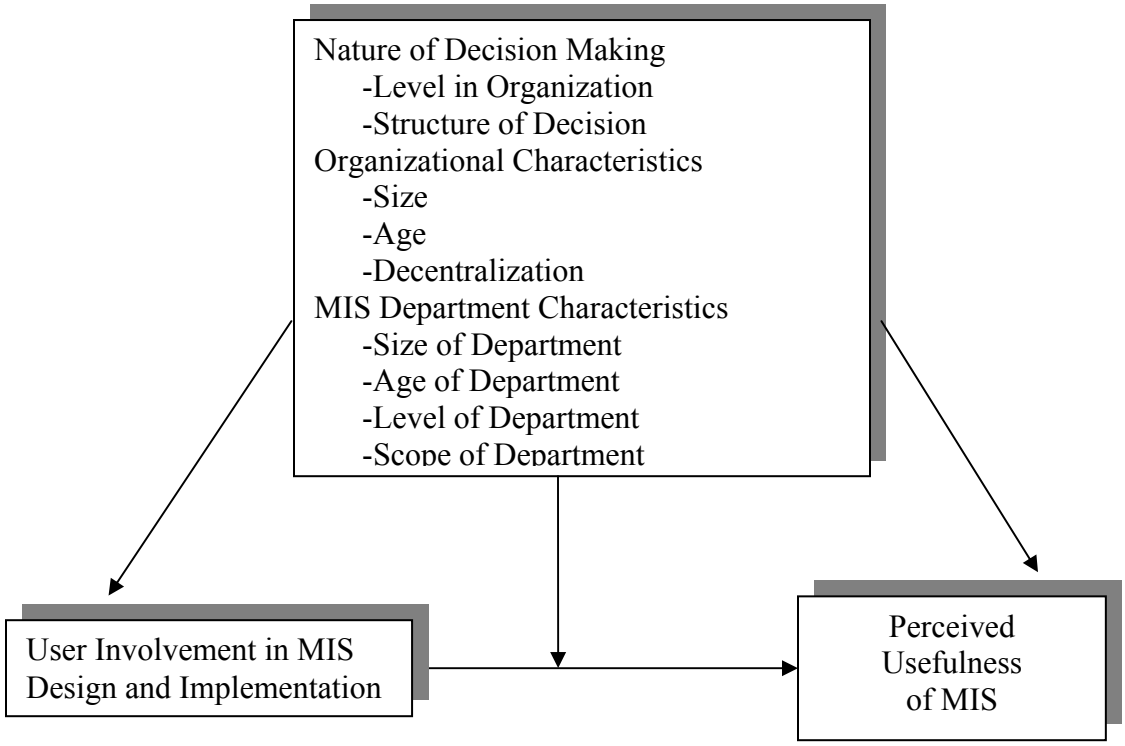
Franz and Robey (1986) investigated the relationship between user involvement in information system development and perceived system usefulness. The study resulted in modest support for the argument that user involvement increases the usefulness of information systems. The authors used organizational factor variables as moderator variables. According to Stone (1978, p. 26), "a moderator is any variable which when systematically varied 'causes' the relationship between two other variables to change."

Several concerns were addressed in that model. Figure 2.5 provides a schematic presentation of the conceptualized relationships as perceived by Franz and Robey (1986, p. 331). The first concern was the direct relationship between involvement and usefulness. Organizational variables and usefulness were another concern, while a third concern was the relationship between user involvement and the perceived usefulness of an information system. While the measure of usefulness in this study depends on user

perceptions, other research showed a positive relation between user attitude and actual use (McFarlan, 1981).

Clearly, further research should investigate the role of the user level in the organizational hierarchy in relation to involvement. The organizational hierarchical level of the user might predict the level of user involvement. In turn, involvement will determine user perception of usefulness of the system.

Mathieson and Ryan (1994) investigated the definitional variations on users' evaluations of information systems. They have documented that different users can define a given information system (IS) in different ways. That is, two users' evaluation of the same IS may not agree on what the system actually is.



Source: Franz & Robey, 1986.

Figure 2.5 Conceptual Relationships among Variables under Study and the Research Concern (Franz & Robey Study)

CHAPTER III

DATA SOURCE AND RESEARCH METHODOLOGY

The aim of the present chapter is twofold: first, to describe and specify the source of data for answering the stated research questions; and second, to describe the methods by which the variables are measured and the analysis is undertaken.

The Data

With respect to the first aim, the data for this study were obtained from a major commercial bank in the state of Mississippi by means of a questionnaire that was designed for the study (see Appendix B). The survey was designed to gather information on the extent to which bank workers participate in the acquisition and implementation of information technology (IT) in their bank working facilities. Also, the study collected information on the users' perceived usefulness of the acquired IT. Survey study was believed to be appropriate for this research because, through the use of questionnaire, the participants could express freely their views and opinions concerning their involvement, and perceived usefulness of the bank IT. The major tasks of this section are to: (1) describe the population of the study, (2) discuss instrument of data collection, (3) assess validity and reliability of the instrument, and (4) specify the procedure of administering the questionnaire.

Population

The population of this study consisted of employees who used information technology in a major bank in the State of Mississippi. At the time of the study, the two bank branches had a total of 54 users to whom the questionnaire was distributed with a request to fill it out. Therefore, the population of this study consists of 54 bank workers. In this study, the term users refer to bank workers who use information technology to carry out their daily bank, routine duties. Selection of the bank in this study was based on convenience and accessibility. The researcher believed that these bank workers were using information technology system (ITS) to carry out their daily job duties. Accordingly, they were expected to provide the information the researcher needed to utilize in responding to the research questions of the study.

Instrument of Data Collection

The questions used in the questionnaire of this study were adopted from Franz and Robey's questionnaire (1986). In developing and testing the questionnaire, Franz and Robey (1986) validated the questionnaire by selecting three dimensions of user involvement from management information systems literature (MIS). The selected dimensions were: (1) system development life-cycle (SDLC) activities, (2) type of user involvement, and (3) responsibilities and decisions for system development activities. They used Cronbach's coefficient Alpha (Cronbach, 1951) to determine the internal consistency of the instrument.

With regard to SDLC activities, O'Brien (2004, p. 345) has mentioned that the SDLC is also known as "information systems development cycle" (ISDC), which

constitutes five stages, namely, "(1) investigation, (2) analysis, (3) design, (4) implementation, and (5) maintenance." Although the MIS literature slightly agreed on the number and stages of the SDLC (Franz & Robey, 1986; O'Brien 2004; Olson & Ives, 1981), most authors, however, agreed that the system development process comprised similar responsibilities and decisions that had to be carried out.

In overcoming the issue of what constitutes the SDLC, Franz and Robey (1986) adopted two general stages of activities that were considered by several authors (Davis, 1974; Lucas, 1978c; Lucas, 1981; Senn, 1978) as essential in developing systems. The first stage was termed "planning and design" and was specified to consist, at least, of the following tasks (Franz & Robey, 1986, p. 336):

1. Conducting feasibility studies
2. Analyzing user requirements
3. Designing user specification
4. Reviewing logical system design.

The second essential stage in developing systems was labeled system implementation and was identified by Franz and Robey (1986, p. 336) as consisting, at least, of the following tasks:

1. Designing physical files
2. Programming and testing
3. Developing user acceptance
4. Converting and installing the new system.

The above conceptualized contents in Franz and Robey's two stages are still consistent with the recent literature (O'Brien, 2004, p. 345), with the following minor addition/modification in the implementation stage:

1. Acquire (or develop) hardware and software
2. Use a post implementation review process to monitor, evaluate, and modify the business system as needed. This is called systems maintenance.

Practically, it is essential in that regard to mention that "all of the activities involved are highly related and interdependent" (O'Brien, 2004, p. 3).

The second measure of user involvement focused on "types" of involvement. The literature on IT covers a variety of user involvement in the stage of system development, among which are: user influence, user-controlled design, socio-cultural responsibilities, and organization change (Abdinnour-Helm, Chaparro, & Farmer; 2005; Agarwal, 2000; Edstrom, 1977; Franz & Robey, 1986; Mahmood et al., 2000; Roy & Bouchard, 1999; Zmud, 1979; Zmud, 2000). The present research follows the approach utilized by Edstrom (1977) and Franz and Robey (1986) with regard to the assessment of the user influence. Unlike Edstrom (1977) who utilized only one Likert-scale type question to measure influence, this research, like that of Franz and Robey (1986, pp. 351-355), assessed influence by describing behaviors that users could possibly have performed during system development. Franz and Robey (1986) measured the behavior with factors such as user suggesting changes, specifying and clarifying expectations, providing questions and answers, and guiding and directing various situations (Abdinnour-Helm, Chaparro, & Farmer, 2005; De Brabander & Edstrom, 1977; Lucas, 1978c; Mahmood et

al., 2000; McKinney et al., 2002; Mumford, 1981; Roy & Bouchard, 1999; Swanson, 1974).

The questionnaire was reviewed and discussed with the president of the bank. The purpose of this step was to minimize any confusing terms or concepts, and to observe the reaction of a practitioner to the questions. Later, the questionnaire was reviewed by the Office of Regulatory Compliance, Mississippi State University. An approval was issued on August 1, 2006 (see Appendix A) and valid for a period till July 15, 2007, in accordance with "45 CFR 46.110 #7," with "docket number (#06-183)." A copy of the questionnaire for this study is given in Appendix B.

The Questionnaire

The questionnaire in this study has been designed to measure the following variables:

1. The degree of user involvement in acquiring technology or system design.
2. The degree of user involvement in implementing technology.
3. User perceived technology usefulness.
4. The hierarchy of the knowledge workers in the organization is represented by Question 8 in Section I part 2 of the questionnaire. This question asked users to locate themselves in one of the four classes of Whitten and Bentley (1986) classification of knowledge workers. An executive user was given a score of 4. A manager user was given a score of 3. A supervisor and a clerical worker were given the scores of 2 and 1, respectively.
5. Experience of the user was represented by 3 questions: 4, 6, and 7. Question 4

inquires about the number of years of service in the bank. Question 6 seeks the number of years in the banking business. Question 7 asks about the number of years of experience in computerized information.

The variable, user involvement, was measured by the amount of perceived influence a user may have during the design and implementation phases. The user perceived influence was measured by using two sets of seven-level Likert-scale questions (Baker, 1994, p. 416). Six questions (9-14, inclusive) refer to the design phase and seven questions (15-21, inclusive) refer to the implementation phase. The quantifying specifications for this and other Likert scales in the questionnaire were conceptualized as follows:

0 = do not know, 1 = not at all, 2 = very little, 3 = little,

4 = moderately, 5 = much, and 6 = very much.

An index or score of user involvement in the design of the technology was computed by adding user responses to questions 9-14, inclusive. A second index of user involvement in the implementation phase was calculated by adding user answers to questions 15-21, inclusive. User perception of system usefulness was calculated by adding user responses to questions 22-32, inclusive. Figure 3-1 conveys the calculation of the three different scores (design, implementation, and usefulness).

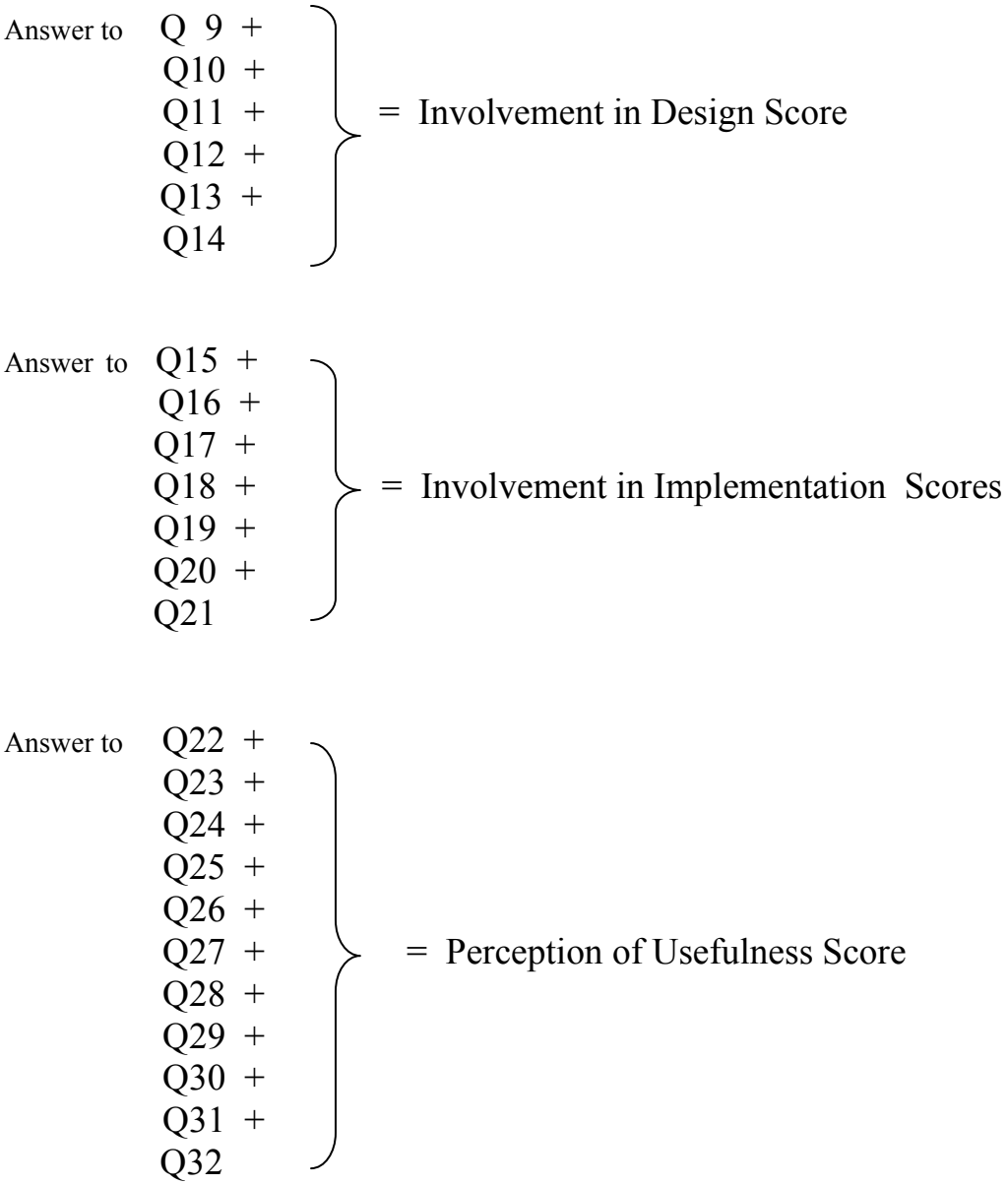


Figure 3.1 Illustration of computing three different scores: Design, implementation, and perception of usefulness (Q = Question)

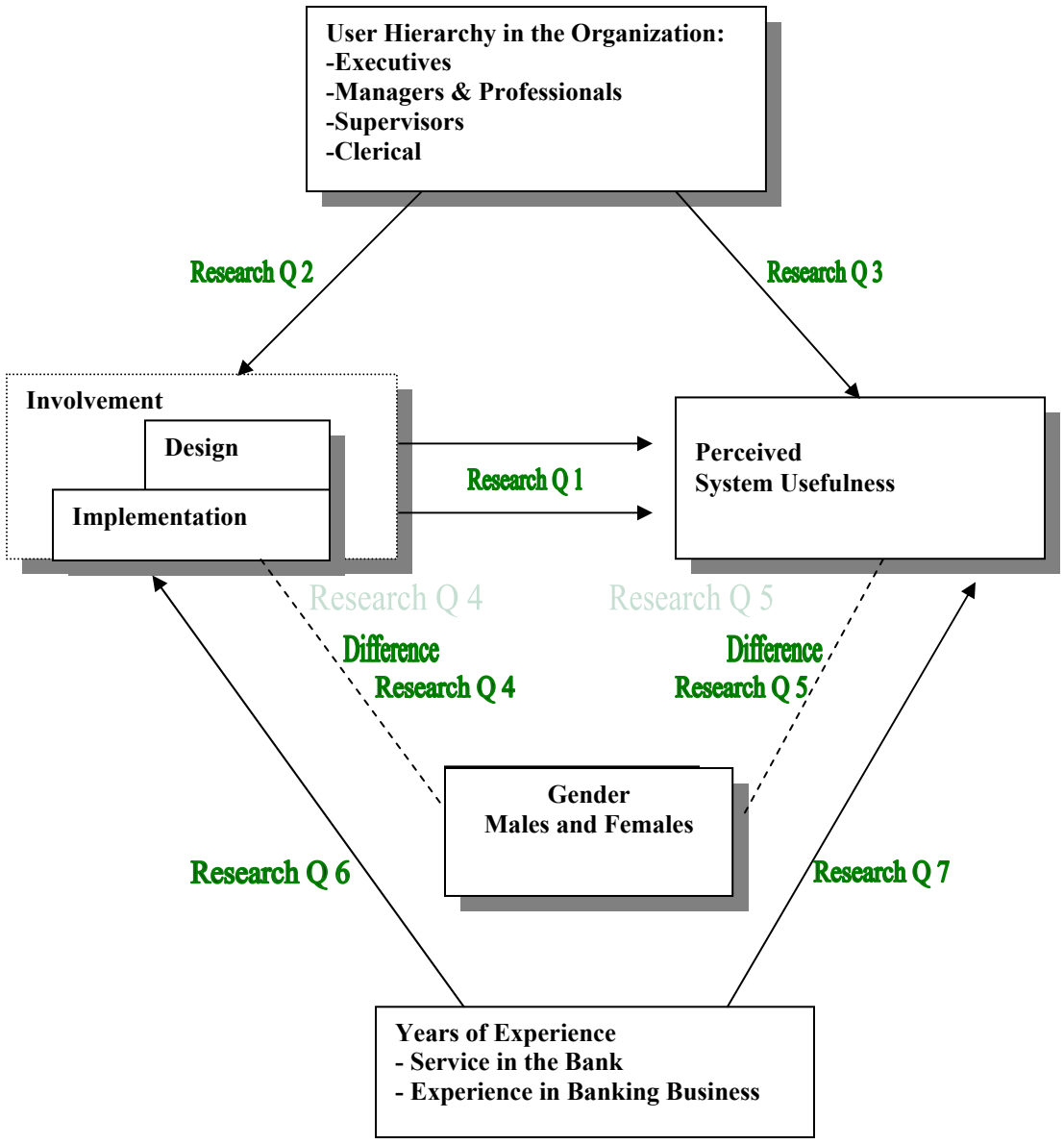
Attitudes of users toward a technology are claimed to be "good" indicator for the success of technology when its use is mandatory, as is the case of the bank in this research (Lucas, 1978a, p. 77). To assess the reliability of the instrument for this study, the coefficients for Cronbach's alpha were calculated and found to be: 0.98, 0.98, and 0.79, for design, implementation, and perceived usefulness, respectively. Accordingly, these coefficients indicate that the instrument is reliable and consistent.

Administration of the Instrument

The Questionnaires were distributed to users. Attached to the questionnaire was a letter to the respondent/user to make sure that he or she knows his/her rights as a respondent. Following the advice of the IRB office at MSU, the researcher provided two-metal locked boxes for the respondents to deposit the completed questionnaires in.

Methods of Data Analysis

This research investigated the relationship between user involvement in the design and implementation of IT and the perception of its usefulness. It also explored the extent to which users' involvement and perceived technology usefulness were related to users' position in the organizational hierarchy. Furthermore, the relationship between user involvement in design, involvement in implementation, perception of usefulness and user years of service in the bank, user years of experience in banking business were explored. Differences between males and females regarding different variables were also examined. Figure 3.2 provides an analytical schematic presentation for the conceptualized relationships in this study.



Legend:

- Arrows point to dependent variables in different relationships.
- Dashed line express testing for differences between males and females.
- Research Q = Research Question

Figure 3.2 Conceptual Model for the Variables in the Study

Analytical Model and Research Questions

Figure 3.2 depicts the relationships of variables that helped the author in answering the seven research questions. The figure shows that perceived usefulness is conceptualized to be impacted by user involvement in both the design and/or implementation of the technology. On the other hand, involvement and perception of usefulness are impacted by users' position in the organizational hierarchy. The arrows in Figure 3.2 are pointing to the dependent variables in the different models or relationships. The dashed line in Figure 3.2 indicates that differences in the scores of males and females were considered and examined.

Inspecting Figure 3.2, one can see that Research Question 1 is expressed in Relationship I; Research Question 2 is marked as Relationship II; …; etc. Research Questions 4 and 5 explored the differences between males and females in involvement and in the perception of usefulness of the system. This relationship (gender differences) is expressed by the dashed lines. Furthermore, the author explored the relationship between years of service in the bank, and years of experience in banking business with the involvement in the design and implementation on one hand and perception of usefulness on the other (Research questions 6 and 7).

Research Question 1

Does a relationship exist between the user involvement in the design and implementation of IT and the perceived usefulness of the system?

The multiple, linear regression was utilized in evaluating the existing relationship as stipulated by the research question. In symbols, the model may be stated as follows:

(Q1): UPTU = a1 + UINVD*b1 + UINVIM*b2 + e

where,

Q1 = Question 1.

UPTU = User perceived technology usefulness.

UINVD = User involvement in design.

UINVIM = User involvement in implementation.

a1= Intercept.

b1 and b2 are regression coefficients of user involvement in design and user involvement in implementation, respectively.

e = error of estimation.

Research Question 2

Does a relationship exist between the user hierarchical position and his/her involvement in the design and implementation of IT?

Both Pearson and Spearman coefficients of correlation (symbolized r and rs, respectively) were used in substantiating this relationship. The use of these two correlation techniques is based on the assumption that one of the values being correlated constitutes rank order and the other constitutes interval scale. In this study, user hierarchy in the organization naturally constitutes an ordinal scale, the other variable (user degree of involvement in design) is an interval (Harshbarger, 1971, p. 424).

Research Question 3

Does a relationship exist between the user hierarchical position and his/her perceived usefulness of IT?

Both Pearson and Spearman coefficients of correlation (symbolized r and rs, respectively) were used in substantiating this relationship. The same assumptions that were used in research Question 2 were used here.

Research Question 4

Does a difference exist between males and females regarding the user involvement in the design and in the implementation of IT?

A t- test was used to determine the statistical significance of answer to this question, one variable is nominal (gender), the other variable is at least interval (user involvement).

Research Question 5

Does a difference exist between males and females regarding the user perceived usefulness of IT?

A t- test was used to determine the statistical significance of answer to this question, one variable is nominal (gender), the other variable is at least interval (user perception of usefulness).

Research Question 6

Does a relationship exist between the user involvement in the design, implementation, and perception of usefulness of IT and years of service in the bank?

The answer to this question is divided into the following parts:

1. Users' involvement in the design (UNIVD) of IT and number of years of service with the bank (NYSB)?
2. Users' involvement in implementing of IT (UINVIM) and NYSB?
3. Users' perception of usefulness of IT (UPTU) and NYSB?

The simple, linear regression technique was utilized to answer each of these parts. The equations were specified as follows:

1. Involvement in design and the number of years of service with the bank:

   $UINVD = a_1 + b_1 (NYSB) + e_1$.

2. Involvement in implementation and the NYSB:

   $UINVIM = a_2 + b_2 (NYSB) + e_2$.

3. Users' perception of technology usefulness and NYSB

   $UPTU = a_3 + b_3 (NYSB) + e_3$

In these three equations, $a_1, \ldots, a_3$, and $b_1, \ldots, b_3$, and $e_1, \ldots, e_3$ are the respective intercepts, regression coefficients, and errors of estimation in the three equations.

Research Question 7

Does a relationship exist between the user involvement in the design, implementation, and perception of usefulness of IT and years of experience in the banking business (NYEBB):

The answer to this question is divided into the following parts:

1. Users' involvement in the design (UNIVD) of IT and number of years of experience in banking business (NYEBB).

2. Users' involvement in implementation of IT (UINVIM) and (NYEBB).
3. Users' perceived technology usefulness (UPTU) and (NYEBB).

The simple, linear regression technique was utilized to answer each of these parts. The equations were specified as follows:

1. Involvement in design and number of years of experience with the banking business: $UINVD = a_1 + b_1 (NYEBB) + e_1$.
2. Involvement in implementation and the NYEBB:

   $UINVIM = a_2 + b_2 (NYEBB) + e_2$.
3. Users' perception of technology usefulness and NYEBB

   $UPTU = a_3 + b_3 (NYEBB) + e_3$

where, $a_1, \ldots, a_3$, and $b_1, \ldots, b_3$, and $e_1, \ldots, e_3$ are the respective intercepts, regression coefficients, and errors of estimation in the three equations.

CHAPTER IV

ANALYSIS OF FINDINGS

This study was designed to assess the effect of user involvement in information technology (IT) on the perception of its usefulness. The aim of the present chapter is to fulfill this task. In order to achieve this objective, the chapter is divided into the following two major parts:

1. General data description.
2. Tests of the research questions.

General Data Description

The number of questionnaires the researcher received was 54. These questionnaires were audited to scrutinize the responses and ascertain the extent of their legibility. The questionnaires of two respondents were eliminated for the following reasons: One respondent indicated that he was new and unable to judge IT usefulness. The other respondent did not provide information beyond the demographic data (first page of the questionnaire). Accordingly, the number of users included in the study was 52. The 52 respondents were described using a set of tables and graphs . This was followed by data analysis using the Statistical package for social sciences (SPSS), release 13.0.

Table 4.1 and Figure 4.1 show the distribution of the 52 respondents by gender. As the table shows, there were 40 females (76.9%) and 12 males (23.1%). The number of females in the bank is more than 3 times the number of males.

Table 4.1 Respondents by Gender

Gender	Number of Users	% of Users
Females	40	76.9
Males	12	23.1
Total	52	100.0

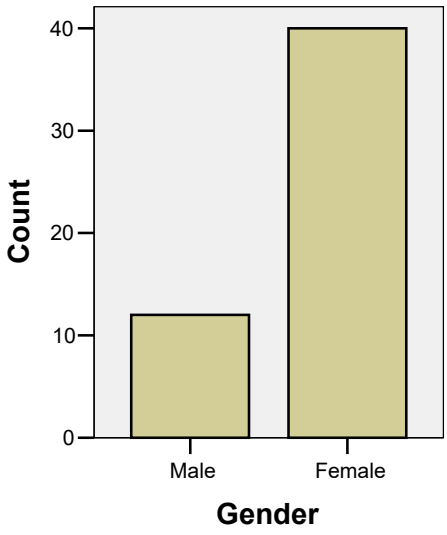


Figure 4.1 Respondents by Gender

Table 4.2 and Figure 4.2 display the distribution of respondents by their education. The majority of the respondents, 24 (42.9), have bachelor degrees followed by those who have two year college, 13 (23.2%). One person has a Master's degree (1.8%).

Table 4.2 Respondents by Education

Education	Number of Users	% of Users
Less than high school	2	3.8
High school	12	23.1
Two years college	13	25.0
Bachelor's degree	24	46.2
Master's degree	1	1.9
Total	52	100.0

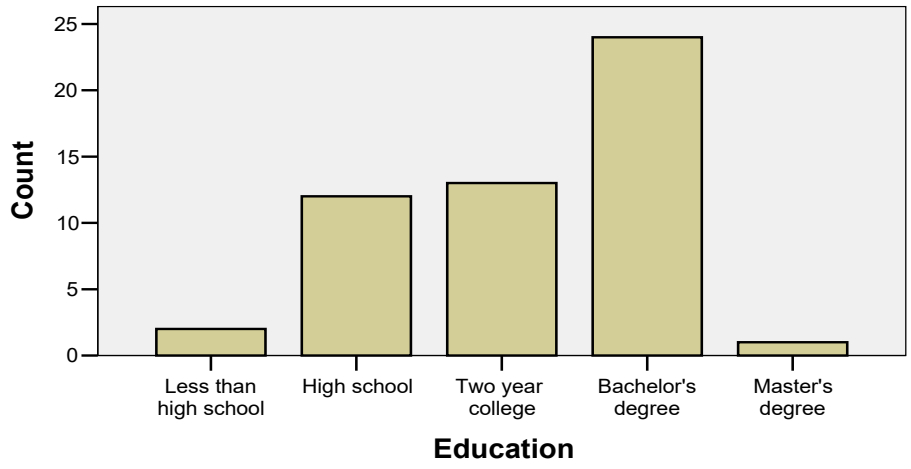


Figure 4.2 Respondents by Education

Table 4.3 and Figure 4.3 demonstrate the number of respondents by hierarchical position in the bank. Hierarchical position is a nominal scale variable. The author opted to transform the nominal scale to an ordinal scale, giving clerical and secretarial category one and assigning the number 4 to the highest rank, executive. As expected in a bank clericals category include the highest number of respondents, 26 (50%). The executive class was the least, 3 (5.8%). Figure 4.3a is another way of expressing the hierarchy in a pyramid like graph. If the number of males in this organization was close to the number of females, Figure 4.3a was going to look like a real pyramid.

Table 4.3 Respondents by Hierarchical Position in the Bank

Hierarchy	Number of Users	% of Users
Clerical or secretarial	26	50.0
Supervisor	12	23.1
Manager or professional	11	21.2
Executive	3	5.8
Total	52	100.0

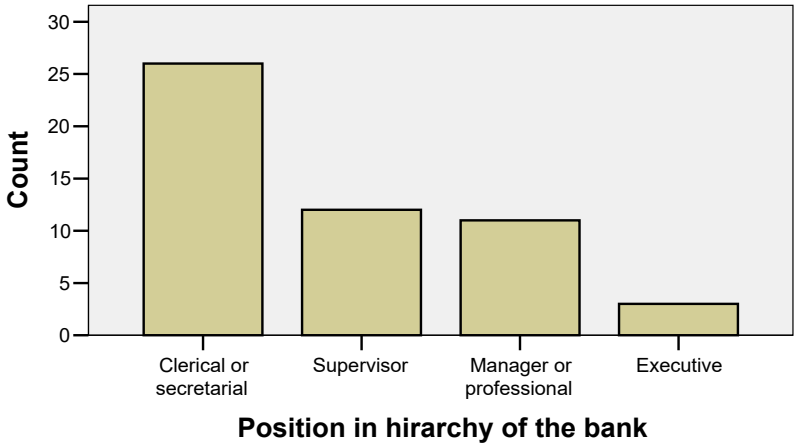


Figure 4.3 Respondents by Hierarchical Position in the Bank

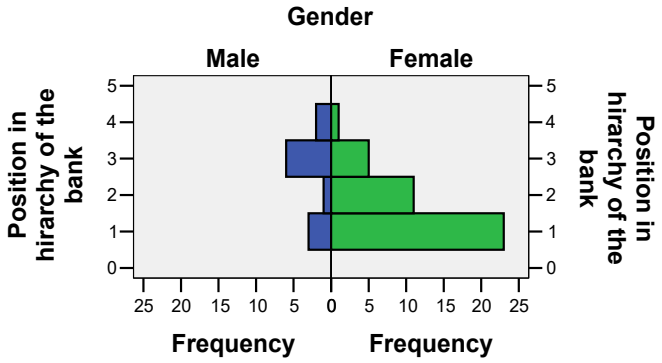


Figure 4.3a Hierarchical Pyramid of Respondents

Table 4.4 and Figure 4.4 illustrate the distribution of respondents according to the score of job satisfaction. The question of job satisfaction was posted at the end of the questionnaire to illuminate and add knowledge about the social environment in the bank. The score ranged from 0 to 6. Twenty two persons (42.3%) gave a score of five. One person (1.9%) gave a score of zero. This means that the person did not want to state the degree of his/her satisfaction.

Table 4.4 Respondents by Job Satisfaction

Job Satisfaction Scores	Number of Users	% of Users
0	1	1.9
3	11	21.2
4	12	23.1
5	22	42.3
6	6	11.5
Total	52	100.0

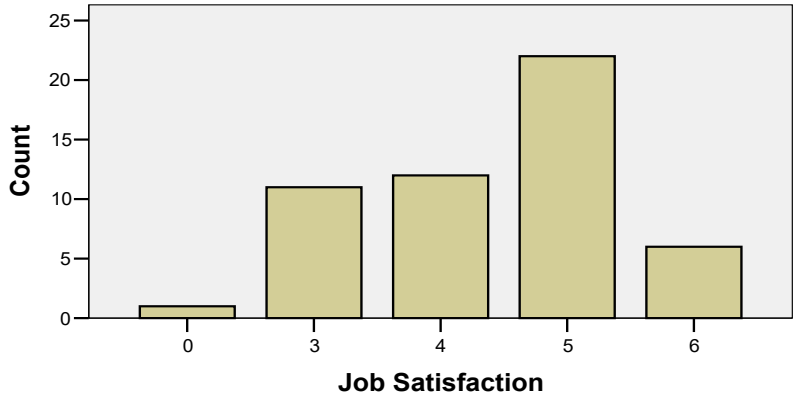


Figure 4.4 Respondents by Job Satisfaction

Table 4.5 and Figure 4.5 depict the number of users by gender and education. The majority of users have bachelor's degree. However, it appears that males enjoy more education than females. Seventy five percent of males and 37.5% of females have Bachelor's degree. On the other hand 1 male and 1 female have less than high school

education. One of the 12 males and 12 of the 40 females have high school education. One male and zero females have Master's degree.

Table 4.5 Respondents by Gender and Education

Education	Males		Females	
	Number	%	Number	%
Less than high school	1	8.3	1	2.5
High school	0	0.0	12	30.0
Two year college	1	8.3	12	30.0
Bachelor's degree	9	75.0	15	37.5
Master's degree	1	8.3	0	0.0
Total	12	100.0	40	100.0

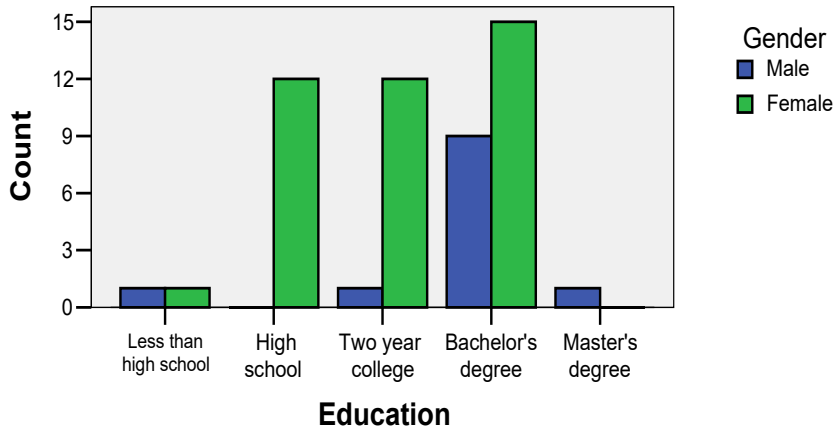


Figure 4.5 Respondents by Gender and Education

Table 4.6 and Figure 4.6 illustrate users by gender and hierarchical position. Out of the 40 females and 12 males, 23 females (58%) and 3 males (25%) are clericals. Two

of the 12 males and 1 of the 40 females are executives. Generally speaking, both the table and the figure show that males are enjoying higher hierarchical positions than females.

Table 4.6 Respondents by Gender and Hierarchical Position

Hierarchical Position	Males		Females		Total	
	No.	%	No.	%	No.	%
Clericals	3	25	23	58	26	50
Supervisors	1	8	11	28	12	23
Managers	6	50	5	13	11	21
Executives	2	17	1	3	3	6
Total	12	100	40	100	52	100

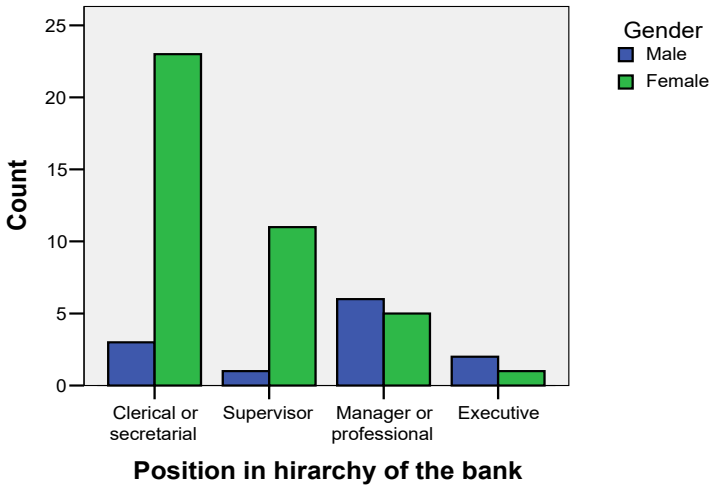


Figure 4.6 Respondents by Gender and Hierarchical Position

Description of Variables used in answering the Research Questions

Variables that are used to answer research question one are: users design scores, users implementation scores, and users perception of usefulness scores. Table 4.7 and Figure 4.7 depict the distribution of the variable design scores (UINVD) and other selected statistical measures. The variable design scores was calculated by adding answers to questions 9 through 14 in the questionnaires. The possible minimum score for one respondent was 0 (the lowest side of scale). The highest possible score value for one respondent was 36 (36= 6 + 6 + 6 + 6 + 6 + 6), there were six questions for the design variable. Table 4.7 shows that the highest frequency score was 6 with a frequency of 20 and a percentage of 38.5. The least frequency was 1 and it appeared in front of several scores with a percentage of 1.9. Figure 4.7 shows a flat normal distribution except in the lower side of the figure, where the value of score 6 falls. This was because a large number of respondents were not involved in the design, assigning a score of one to all the design questions. The data in Table 4.7 and their depiction in Figure 4.7 show a multimodal distribution.

The variable implementation scores were calculated by adding answers to questions 15 through 21 in the questionnaires. The minimum possible score for one respondent was 0 (the lowest side of the scale). The highest possible score for one respondent was 42 (42 = 6 + 6 + 6 + 6 + 6 + 6 + 6), there were seven questions for the implementation variable. Table 4.8 shows that the highest frequency was associated with the score 7. Nineteen of the 52 respondents are in that category with a percentage of 36.5. The least frequency was 1 and it appeared with several scores with a percentage of 1.9.

Table 4.7 Number and Percentages of Respondents by Design Scores

Design Scores	Number of Users	% of Users
0	4	7.7
6	20	38.5
7	2	3.8
9	1	1.9
11	1	1.9
12	8	15.4
13	1	1.9
15	1	1.9
16	5	9.6
17	1	1.9
18	5	9.6
28	1	1.9
30	2	3.8
Total	52	100.0

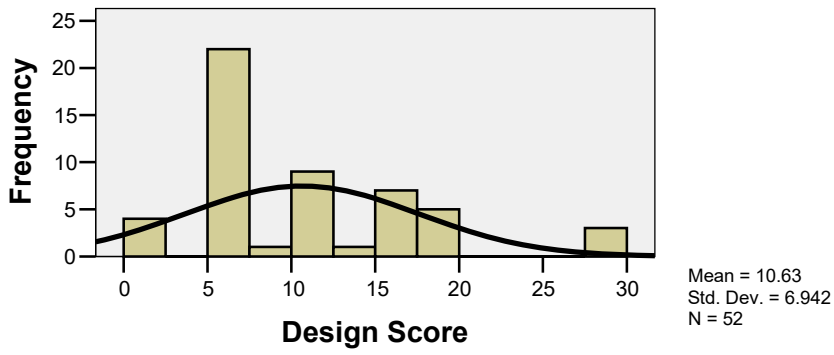


Figure 4.7 Distribution of Design Scores

Like the design scores, the implementation scores presented in Table 4.8 and Figure 4.8 show a relatively flat distribution, with a high spike on the lower end of the figure where the score 7 falls. The distribution of the implementation scores is multimodal, like that of the design scores.

Table 4.8 Number and Percentages of Respondents by Implementation Scores

Implementation Scores	Number of Users	% of Users
0	3	5.8
6	1	1.9
7	19	36.5
10	2	3.8
13	1	1.9
14	7	13.5
15	1	1.9
16	2	3.8
17	1	1.9
18	1	1.9
19	1	1.9
20	3	5.8
Total	52	100.0

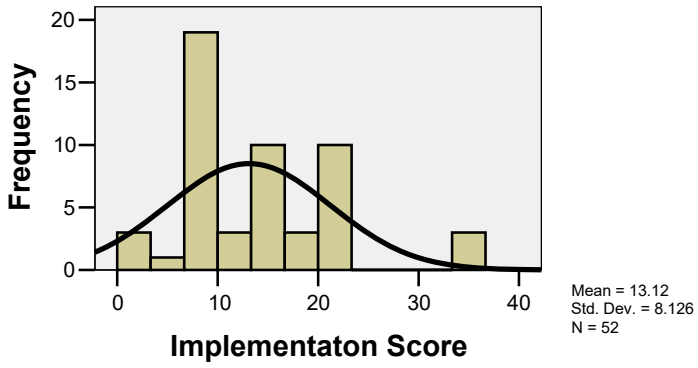


Figure 4.8 Distribution of Implementation Scores

Unlike the distribution of the design scores and that of the implementation scores, the usefulness scores are closely related to the normal distribution (Table 4.9 and Figure 4.9). Both the table and the figure portray the distribution of the variable user perception of technology usefulness scores. The UPTU scores was calculated by adding answers to questions 22 through 32 in the questionnaires. The possible minimum score is 0 and the possible highest score is 66 (66 = 6 +6 +6 +6 +6 +6 +6 +6 +6 +6 +6). There were 11 questions for the usefulness variable. Table 4.9 and Figure 4.9 show that the highest frequency in the distribution is 5, and it is associated with the scores of 33 and 40, with a percentage of 9.6. The least frequency in the distribution is 1. Several scores have the frequency of 1, with a percentage of 1.9. As was mentioned before, the frequencies are well distributed between the different scores approximating an almost perfect normal distribution.

Table 4.9 Number and Percentages of Respondents by Usefulness Scores

Scores	Number of Users	% of Users
0	1	1.9
11	1	1.9
18	1	1.9
19	1	1.9
20	2	3.8
23	1	1.9
27	4	7.7
29	4	7.7
30	2	3.8
32	2	3.8
33	5	9.6
34	1	1.9
36	4	7.7
37	2	3.8
38	1	3.8
39	3	5.8
40	5	1.9
44	2	3.8
47	1	1.9
48	1	1.9
49	1	1.9
60	1	1.9
Total	52	100.0

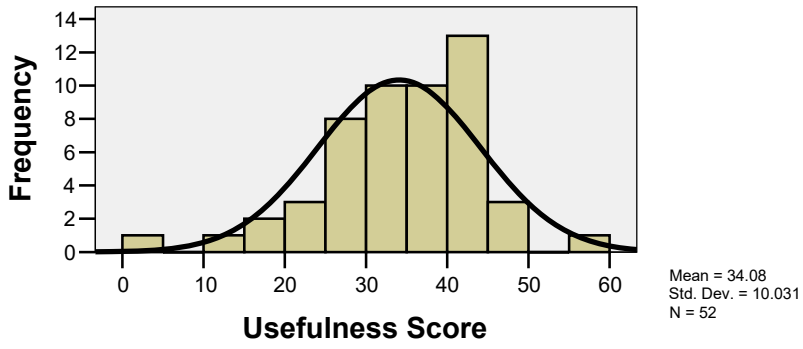


Figure 4.9 Distribution of Usefulness Scores

Table 4.10 illustrates the hierarchical level of users classified by years of service in the bank. Clericals category had the highest number of respondents, 26, with a percentage of (50%) relative to the 52 employees. Clerical's frequency ranges from 19 (36.5%) users that falls in the category < 5 years of service in the bank to 1 (1.9%) respondent that falls in the category 15-20 years of service in the bank. Nineteen clerical users worked in the bank for less than 5 years. Only one clerical respondent had 15 years or greater experience in the bank. On the other hand, the 3 executives who were working in the bank were there for at least 10 years. Two of these executives have been with the bank for 15-20 years or more.

Table 4.10 Users' Hierarchical Positions by Number of Years of Service with the Bank (N=52)

Hierarchical Level	Years of Service									
	< 5		5-9		10 -14		15-20		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Clericals	19	36.5	4	7.7	2	3.8	1	1.9	26	50.0
Supervisors	1	1.9	6	11.5	2	3.8	3	5.8	12	23.1
Managers	1	1.9	2	3.8	6	11.5	2	3.8	11	21.2
Executive	-	-	-	-	1	1.9	2	3.8	3	5.8
Total	21	40.4	12	23.1	11	23.1	8	15.4	52	100.0

Note: Percentage total for rows and columns may not add to their respective entries due to rounding.

Table 4.11 portrays the hierarchical level of respondents classified by the number of years spent in the banking business. The highest frequency in the table is 17 (32.7%). Those are the clerical respondents or users who worked in the banking business for less than 5 years. Only one clerical respondent has experience with the banking business for 25-30 years or more. Four (7.7%) of the clerical respondents have been in the banking business for 10-14 years. Three executives (5.8%) have been in the banking business for 20-24 years. User managers are more differentiated in their experience in the banking business. Three of the 11 managers (5.8%) have been in the banking business for 10-14 years. Another 3 (5.8%) of the 11 managers have experience in the banking business from 15 – 19 years.

Table 4.11 Users' Hierarchical Positions by Number of Years of Experience in Banking Business (N=52)

Hierarchical Level	Years of Experience in Banking													
	<5		5-9		10-14		15-19		20-24		25-30		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No	%
Clericals	17	32.7	2	3.8	4	7.7	1	1.9	1	1.9	1	1.9	26	50.0
Supervisors	-	-	4	7.7	4	7.7	2	3.8	1	1.9	1	1.9	12	23.1
Managers	1	1.9	1	1.9	3	5.8	3	5.8	1	1.9	2	3.8	11	21.2
Executives	-		-		-		-		3	5.8	-	-	3	5.8
Total	18	34.6	7	13.5	11	21.2	6	11.4	6	11.4	4	7.7	52	100.0

Note: Percentage total for rows and columns may not add to their respective entries due to rounding.

Statistical Tests of Research Questions

This section of the chapter provides research findings by answering the seven research questions of this study.

Research Question 1

Does a relationship exist between the user involvement in the design and implementation of IT and the perceived usefulness of the system? This research question was formulated to help uncover any statistical relationship between users' involvement in the design and implementation of IT and the perceived usefulness of such technology. As indicated in Chapter III, the utilized multiple regression equation (MRE) is symbolically stated as follows:

(Q_1): $UPTU = a_1 + UINVD*b_1 + UINVIM*b_2 + e$

where,

Q_1 = Question 1.

UPTU = User perceived technology usefulness.

UINVD = User involvement in design.

UINVIM = User involvement in implementation.

a_1= Intercept

The dependent variable UPTU (user perception of technology usefulness) is expressed by a score calculated by adding the answers to question 22 through question 32. The first independent variables, UINVD (user involvement in design) is expressed by a score calculated by adding the answers to question 9 through question 14. The second independent variable, UINVIM (user involvement in implementation of the technology) is expressed by a score calculated by adding the answers to question 15 through question 21. Figure 3.1 (p.43) is a pictorial presentation for calculating the 3 different scores.

Table 4.12 and Table 4.13 give the statistical results of the Multiple Linear Regression Model to test for Research Question 1. According to those two tables the resulted regression equation may be written as follows:

$$UPTU = 26.968 + 1.279\ UINVD + (-.495)\ UINVIM + 8.769$$

Table 4.12 gives the correlation matrix, multiple R^2 (coefficient of multiple determination), the simple correlations between the variables, and the standard error of estimation. The value of the coefficient of determination is 0.266. This means that about 27% of the variation in user perception of technology (UPTU) is accounted for by using

this model. Table 4.13 shows the intercept coefficient to be 26.97 and statistically significant. This is the value of UPTU when the two independent variables are zero.

Table 4.12 Results of the Multiple Linear Regression Model to Test for the Relationship as Stated in Research Question 1 (N=52)

	Correlation Matrix		
Item	Usefulness Score	Design Score	Implementation Score
Usefulness Score	1.000	.502	.455
Design Score		1.000	.956
Implementation Score			1.000
Multiple R^2 =	.266		
Standard Error of Est.=	8.769		
p =	.001		

Table 4.13 Results of the Multiple Regression Equation (Research Question 1) (N = 52)

Item	Regression and Intercept	Standard Error	t	ρ
Intercept	26.968	2.326	11.595	.001
Design Score	1.279	0.602	2.124	.039
Implem. Score	-0.495	0.515	-0.920	.341

It appears that the users who are not involved in design or implementation still find IT to be useful, with the score of 26.97. Table 4.13 also shows that the coefficient b_1 = 1.279. This is the change in the dependent variable (UPTU) that results from one unit change in the independent variable (UINVD). Likewise, the coefficient b_2 = -.495, this is the change in the dependent variable (UPTU) that takes place with one unit change in the independent variable (UINVIM). A negative and statistically insignificant regression coefficient (as in this case) calls for further investigation.

Table 4.12 shows the correlation coefficient between the two independent variables (UINVD and UINVIM) to be 0.956. Afifi and Clark (1990, p. 162) indicate that if two independent variables "X_1 and X_2 are highly correlated (say greater than 0.95), then" the problem of muticollinearity occurs. In this case, "it may be simplest to use only one of them." The regression model was tried again with one independent variable (simple linear regression). The independent variable user involvement in the design of the system was the choice variable, simply because it is more significant ($\underline{p}$ = .039) than the other independent variable, user involvement in the implementation of the system. The results are shown in Table 4.14 and Table 4.15.

Table 4.14 Results of the Simple Regression Model to Test for the Relationship as Stated in Research Question 1 (N=52)

	Correlation Matrix	
Item	Usefulness Score	Design Score
Usefulness Score	1.000	0.502
Design Score		1.000
r^2 =	0.252	
Standard Error of Est.=	8.763	
p =	0.001	

Table 4.15 Coefficients of the Regression Equation (Research Question 1). (N = 52)

Item	Regression and Intercept	Standard Error	t	p
Intercept	26.365	2.238	11.780	.001
Design Score	0 .725	0.177	4.103	.001

Comparing Table 4.13 and Table 4.15, we find that both the standard error of estimate and the p value have improved. Hence one may conclude that the simple linear regression model is more suitable for this issue. It appears that the more the user is involved in the design of IT system, the more he or she perceive the system as useful. The new regression equation may be written as follows:

UPTU = 26.365 + .725 UINVD + 8.763 (standard error for the model).

It appears from this research that when the user was involved in the design and implementation of IT he/she saw the system as more useful. Generally, the obtained results were consistent with those of Franz and Ruby (1986, p.340) who indicated that "user involvement was related positively to system usefulness (although the association was stronger for the design stage)". It also appears that when the user is not involved in system development life cycle, he/she still see the IT system as a little useful. In this study, the theoretical user gave a score of 26.635 (table 4.15) for IT usefulness. Keep in mind that the minimum possible score for the usefulness is 0 and the maximum possible score is 66. A score of 27 (exactly 26.636) is not high. Certainly, the IT manager would like to see a much higher score for the usefulness of IT.

Both academics and practitioners will continue searching for these magical factor/factors that satisfy the IT user and help him/her to see the system as highly useful. The data at hand also show that most users have low scores in both design and implementation, evident in Figure 4.7 and Figure 4.8. This confirms an informal discussion between the author and an executive in the bank in which the executive indicated that local users are not involved in any phase of system development life cycle. Why then some users reported involvement in design and in implementation is a mystery. I am sure that some users do think that they are involved. Those users could be involved in something else, say meetings in the head quarter office of the bank to discuss the needs to update training, or the needs to buy certain software or hardware. A user who is involved in committees may regard himself as involved in SDLC (design or implementation phase).Other users might be diluted, like a thirsty person who sees a

mirage in the dessert . Those are users who starve for self importance and recognition. Other users lie intentionally in attempting to cope and adapt to a difficult technology event (answering the questionnaire) (Beaudry & Pinsonneault, 2005). Still other users think it is more socially acceptable to be involved (Baker, 1994). It is even more baffling to the author of this research, why does the involvement in design carry more weight than the involvement in implementation in both this research and in Franz and Ruby (1986). If the matter is appearances, it could be that the word design is more associated with prestige and sophistication than that of implementation. Or it could be that the design battery in the survey precedes the implementation battery. Hence, by the time the user answers the design battery, the struggle for adaptation wears off and the user becomes more relaxed.

Research Question 2

Does a relationship exist between the user hierarchical position and his/her involvement in the design and implementation of IT? One of the variables is ordinal (the hierarchical position of the user) and the other one is ratio scale (user involvement in design). Hence, nonparametric as well as parametric tests may be suitable to answer this question. For the UINVD and the hierarchy of the user both Pearson's product moment correlation and Spearman's correlation (rho) were used. At this point, it appears that there is no relationship between the hierarchical position of the user and his/her involvement in the design and implementation of the system. Tables 4.16 and 4.17 show the results of Pearson and Spearman correlation coefficients for Questions 2 and 3.

Table 4.16 Results of Pearson Correlation Coefficients for the Relationships Between Hierarchical Position and Other Variables (Research Questions 2 & 3) (N=52)

Item	Hierarchical Position	Level of Sig. (p)
User involvement in the design phase	0.137	.334
User involvement in implementation phase	0.085	.548
User perception of technology usefulness	0.380	.005

Table 4.17 Results of Spearman Correlation Coefficients for the Relationships Between Hierarchical Position and Other variables (Research Questions 2 & 3) (N=52)

Item	User Hierarchical Position	Level of Sig. (p)
User involvement in the design phase	0.230	.101
User involvement in implementation phase	0.143	.313
User perception of technology usefulness	0.493	.001

Table 4.16 shows a modest Pearson correlation coefficient of 0.137 for the relationship between the design score and the hierarchical position ($p = 0.33$). Table 4.17 shows a Spearman correlation coefficient of 0.230 for the relationship between the

design score and the hierarchical position ($p = 0.10$). The Pearson correlation between UINVIM and the user hierarchical position was .085 ($p = 0.55$). The Spearman correlation for the same relationship yielded a coefficient of 0.143 ($p = 0.31$).

It appears that the hierarchical position of the user does not make a difference in involvement in design or implementation of IT. Franz & Robey (1986) investigated different levels of IT managers. Their conclusion regarding involvement in design and implementation was the same. In other words different levels of the professional ladder were not associated with the degree of involvement in the design phase or in the implementation phase. However, in the current research, the sample size in the higher hierarchical levels was small, 3 executives, 11 upper management, 12 middle management, and 26 clericals (Table 4.6). These results confirmed and stressed the conversation between the author and the bank executive. In this case, it appears that the high hierarchical level did not feel that they had to lie or show up.

Research Question 3

Does a relationship exist between the user hierarchical position and his/her perceived usefulness of IT? To respond to this question, both Pearson product-moment and Spearman rho correlation were used. Pearson correlation produced a coefficient of 0.380 with a ρ value of 0.005. Spearman rho correlation yielded a coefficient of 0.493 with a ρ value of 0.001. Both Tables 4.16 and 4.17 portray the answer to this question. As the tables show, the answer to this question was positive for both Pearson and Spearman correlation 0.380 and 0.493, respectively. The p values were .005 and .001 respectively. Simply stated, the value of the level of significance indicates the importance

"a researcher attaches to the consequences associated with incorrectly rejecting" the null hypothesis (Harnett, 1971, p. 223). In the current analysis, Spearman correlation coefficient is more efficient than the Pearson correlation since it is significant at 0.001 (the chance is1 in 1000 to be erroneous) whereas that of Pearson is 0.05 (1 in 20 to be erroneous). At this point, it appears that the higher the user position in the hierarchy of the bank, the more he/she regard the system as useful.

More explication of the results obtained for Research Questions 2 and 3 were that among bank employees, knowledge workers in different hierarchical positions in the bank appeared to view the role of IT and its usefulness in executing their banking tasks in varying degrees. The utilized hierarchical ranking and the positive correlation implied that those in senior positions in the bank appeared to appreciate usefulness of the IT system more than those in subordinate positions. This interpretation is consistent with the findings obtained by Franz and Robey (1986, p. 345). A statement of caution here is that the higher hierarchical users are those users who have more experience with the bank and with banking business. Hence, it is a bit difficult to determine whether the users in high hierarchical positions see the system as more useful because of their experience or because they are in control. Further studies are needed to clarify and elaborate this point.

Research Question 4

Does a difference exist between males and females regarding the user involvement in the design and in the implementation of IT? The t-test was used to answer this question. This test is appropriate for this issue because of the following: (1) the variances of the two populations (males and females) are unknown; consequently we

do not know the standard error of the sampling distribution of mean differences. (2) The total sample size for males and females is ≤ 100. The number of degrees of freedom in this case is the total sample size (52) minus 2, i.e., 50. Accordingly, t_{50} = (mm – mf) /s{ sq. root (1/m + 1/f)}, where

m = number of males

n = number of females

mm = male mean

fm = female mean

s = pooled standard deviation.

The results rendered by the SPSS for the t-test are presented in Table 4.18. The results indicate that the t values are not significant at p = .05. Accordingly, one may conclude that there is no difference between males and females in the involvement in the design and implementation of IT.

Table 4.18 The t-Test for the Differences between Males and Females Regarding Involvement in Design and Implementation of IT (Research Question 4) (N = 52)

Involvement	mm	fm	t-test Results		
			t	df	p
Design	11.83	10.28	0.707	50	.483
Implementation	14.08	12.83	0.781	50	.811

mm = male mean
fm = female mean

Research Question 5

Does a difference exist between males and females regarding the user perceived usefulness of IT? The researcher applied the t-test to answer this question, based on the argument concerning this test as given in answering Question 4 above. The results as given in Table 4.19 indicated the difference between male-and-female users in perceived usefulness of IT was not significant. Accordingly, one might conclude that there was no difference between males and females regarding the perceived usefulness of IT.

Table 4.19 The t-test for the Difference between Males and Females Regarding Perceived Usefulness of IT (Research Question 5) (N=52)

Item	mm	fm	t-test Results		
			t	df	p
Perceived Usefulness	34.50	33.95	0.088	50	.930

mm = male mean
fm = female mean

Although the results of analysis for questions 4 & 5 showed that the differences between male scores and females scores for different variables (design scores, implementation scores, and usefulness scores) were not statistically significant, the male means were consistently higher than female means (tables 4.18 and 4.19). In addition, the statistically insignificant results could imply that banking tasks are mostly standardized in away that foster the equality between males and females. On the other hand the consistent higher scores of males might indicate that males feel that they are

more in control of situations. Furthermore, males occupy higher positions in the hierarchy of the bank. This can help them feel more involved than females. Finally, a larger percentage of males might lead to different findings.

Research Question 6

Does a relationship exist between the user involvement in the design, implementation, and perception of usefulness of IT and years of service in the bank? The answer to this question is divided into the following parts:

1. Users' involvement in the design (UNIVD) of IT and number of years of service with the bank (NYSB).
2. Users' involvement in implementing IT (UINVIM) and (NYSB).
3. Users' perceived technology usefulness (UPTU) and (NYSB).

The simple, linear regression technique was utilized to answer each of these parts. The equations were specified as follows:

1. Involvement in design and the number of years of service in the bank.

   $UINVD = a_1 + b_1 (NYSB) + e_1$.

2. Involvement in implementation and the number of years of service in the bank.

   $UINVIM = a_2 + b_2 (NYSB) + e_2$.

3. Users' perceived technology usefulness and the number of years of service in the bank.

   $UPTU = a_3 + b_3 (NYSB) + e_3$.

In these three equations, $a_1, \ldots, a_3$, and $b_1, \ldots, b_3$, and $e_1, \ldots, e_3$ are the respective intercepts, regression coefficients, and errors of estimation in the equations.

Table 4.20 summarizes the major statistics of simple linear regression needed to answer this question as conceptualized above. Specifically, the provided inferential statistics constitute Pearson correlations, coefficients of intercepts and regressions, r^2, and error of estimation. In addition, Table 4.20 provides the relevant p values for the different measures. The highest correlation coefficient is that for the relationship between UPTU and NYSB (0.292). The same applies to regression coefficients (0.524), where user perceived technology usefulness is the greatest and the most significant (p=04). The coefficient of determination of perceived usefulness with experience with the bank was also the highest (0.085). It indicates the amount of variation in UPTU explained by the NYSB, which amounts to 8.5% in this case. Implementation was the lowest and the most insignificant. The same interpretation could be applied to regression coefficients where perceived usefulness was the greatest and the most significant. At this point, it appears that there is no relationship between years of service in the bank and involvement in the design and implementation of IT. On the other hand, users who have more years of service in the bank perceived the IT system as more useful.

It appears that years of service in the bank does not have an impact on neither the degree of involvement in design nor the degree of involvement in implementation. However, the longer the years of service in the bank the more the user perceived the IT as useful.

Table 4.20 Pearson Correlation and Simple Regression for the Relationships Between Users' Involvement in Design, Implementation, Perceived Usefulness of IT, and Years of Service in the Bank (Research Question 6) (N=52)

Item	Number of Years of Service in the Bank	Level of Sig (p)
User involvement in the design phase		
Pearson correlation	0.123	.129
Regression intercept	8.474	.001
b coefficient	0.264	.129
r^2	0.045	
Std. error of estimate	6.850	
User involvement in the implementation phase		
Pearson correlation	0.200	.156
Regression intercept	10.747	.001
b coefficient	0.290	.156
r^2	0.040	
Std.error of estimate	8.041	
User perception of technology usefulness		
Pearson correlation	0.292	.036
Regression intercept	29.798	.001
b coefficient	0.524	.036
r^2	0.085	
Std. error of estimate	9.689	

The insignificant relationship obtained between the number of years of service in the bank and user involvement in design and implementation may be related to the phenomena of centralization/decentralization of IT, a variable that is beyond the scope of this study. The absence of this relationship may also be a result of commissioning the IT service to an external provider. During the era of mainframe computers, "computer

hardware and software, databases, and information specialists (were) at the corporate level of organizations" (O'Brien, 2004, p. 429). However, the spread of minicomputers and microcomputers led many organizations to decentralize these activities. Recently, there has been a shift toward centralization of "the IS resources of a company, while still serving the strategic needs of its business units, …This has resulted in the development of hybrid structures…"(O'Brien, 2004, p. 429).

The relationship that appear between years of service in the bank and usefulness of IT gives support for the findings obtained by Mahmood et al, (2000). More years of service in the bank lead to becoming familiar with the infrastructure of IT available in the work environment, This familiarity results in "perceived ease of use and perceived usefulness…if the users perceive the system to be easy to use, they need less effort to use it, and will have more time for other activities, …"(Mahmood et al., 2000, p. 754)

Research Question 7

Does a relationship exist between the user involvement in the design, implementation, and perception of usefulness of IT and years of experience in the banking business? The answer to this question is divided into the following parts:

1. Users' involvement in the design (UNIVD) of IT and number of years of experience in banking business (NYEBB).
2. Users' involvement in implementing IT (UINVIM) and NYEBB.
3. Users' perceived technology usefulness (UPTU) and NYEBB.

The simple, linear regression technique was utilized to answer each of these parts. The equations were specified as follows:

1. Involvement in design and number of years of experience with the banking business: UINVD = a_1+ b_1 (NYEBB) + e_1.
2. Involvement in implementation and number of years of experience with the banking business: UINVIM = a_2 + b_2 (NYEBB) + e_2.
3. Users' perceived technology usefulness and number of years of experience with the banking business: UPTU = a_3 + b_3 (NYEBB) + e_3.

In these three equations, a_1,…, a_3, and b_1, …, b_3, and e_1, …, e_3 are the respective intercepts, regression coefficients, and errors of estimation in the equations. . At this point, it appears that there is no relationship between years of years of experience in the banking business and involvement in the design and implementation of IT. On the other hand, users who have more years of experience in the banking business perceived the IT system as more useful.

Table 4.21 Summarizes the major statistics of simple linear regression needed to answer this question as conceptualized above. Specifically, the provided inferential statistics constitute Pearson correlations, coefficients of intercepts and regressions, r^2, and error of estimation.

Just like the results of Research Question 6, the results of Research Question 7 show that the highest Pearson correlation is that for the relationship between UPTU and NYEBB (0.404). The regression coefficient for UPTU with NYEBB is 0.479, higher than that for UINVD (0.119) and UINVIM (0.074). The coefficient of determination for

UPTU with NYEBB is also higher (0.163) than those for UINVD and UINVIM, with NYEBB, 0.021 and 0.006, respectively.

Table 4.21 Pearson Correlation and Simple Regression for the Relationships Between Users' Involvement in Design, Implementation, Perceived Usefulness of IT, and Experience in the Banking Business. (Research Question 7) (N=52)

Item	Number of Years of Experience in Banking Business	Level of Sig. p
User involvement in the design phase		
Pearson correlation	0.145	.306
Regression intercept	9.291	.001
b coefficient	0.119	.306
r^2	0.021	
Std. error of estimate	6.938	
User involvement in the implementation phase		
Pearson correlation	0.077	.588
Regression intercept	12.280	.001
b coefficient	0.074	.588
r^2	0.006	
Std. error of estimate	8.182	
User perception of technology usefulness:		
Pearson correlation	0.404	.003
Regression intercept	28.655	.001
b coefficient	0.479	.003
r^2	0.163	
Std. error of estimate	9.266	

The obtained results indicate that experience with banking business (NYEBB) emerged as a better indicator for UPTU than that of years of service in the bank (NYSB).

Such findings attest to the shift the commercial banks in the United States have been making from electronic data processing (EDP) to the widespread application of computers and IT since 1955 (O'Brien, 1968 p. v & 2004, p. 21).

It appears that users who have more experience in banking business perceive the IT system as more useful than those who have less experience in banking business. The experience in banking business is superior to the experience in the bank since the former connotes diversified expertise that is required for handling business intelligence in information driven society. In the United States a wave of consolidations began in the 1980s and led to a movement of mergers, including "government-aided acquisition of savings and loans" (Rapp, 2002, p.227). Such objectives require IT for their realization. It was for these reasons that a strong relationship existed between the user's perception of usefulness of IT and years of experience in the banking business.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

This chapter summarizes the present study, and provides conclusions and recommendations for future research. The contents of the chapter are divided into the following sections: Summary of objectives and procedures, summary of findings, discussion and conclusion, limitations, and recommendations.

Summary of Objectives and Procedures

As a result of the significant shift in the developed world from an international industrial economy to a global blended system of information technology, a variety of research issues have been addressed by academics and practitioners. Most of these issues are concerned with the production and utilization of information technology (IT). The reviewed literature reported almost general agreement that success of information systems (IS) could be enhanced by involving the users in the development and implementation of those systems. It should be mentioned, however, that some empirical studies did not support these arguments unequivocally. Such uncertainty might be due to overlooking the user position in the hierarchy of the organization within which systems were implemented. Another variable that has been largely neglected is the experience with the system or with similar systems.

Hence, this study was designed to refine our current knowledge about user involvement in system development life cycle (SDLC) by examining the hierarchical level of the user in the organization and the moderating effect it exerts on the relationship between involvement and perceived usefulness of IT. In addition, the study explored user experience with the particular system and experience with similar systems. The study classified knowledge workers into four categories namely, clericals or secretarial, supervisors, managers or professionals, and executives (Whitten &Bentley, 1986; O'Brien, 2004).

The author's selection of a commercial bank to answer the stated research questions has been stimulated by the fact that commercial banks have been pioneers in the use of electronic data processing (EDP). Furthermore commercial banks make the shift from this technological level to the use of computers and information systems (IS) since 1955. An understanding of how involvement in design and implementation of IT could result in the perception of its usefulness should benefit management. Managers of information technology can profit from this knowledge by having an efficient knowledge workforce to handle the daily operations of the business organizations.

The population for this study consisted of 54 respondents (users) in one of the major commercial banks in Mississippi. Two subjects did not finish completing the questionnaires. Hence the research was conducted using 52 subjects. Due to time constraint and research costs, the studied bank was chosen because of its accessibility to the author, since frequent personal contacts with bank personnel were necessary for the

success of the research. Moreover, this bank expressed willingness to cooperate with the author in this undertaking.

Summary of Findings

Research Question 1

Does a relationship exist between the user involvement in the design and implementation of IT and the perceived usefulness of the system? The statistical results of this question indicated that the multiple coefficient of determination (R^2) accounted for 27 percent of the variation of perceived usefulness. However, the regression coefficient for the variable UINVIM were statistically insignificant. Furthermore, multicollinearity that existed between user involvement in design (UINVD) and user involvement in implementation (UINVIM), revealed that the multiple regression model as worthless in this case. Based on these statistical results, one may conclude that users' involvement in implementation of IT (UINVIM) is not a "good" indicator when users' involvement in design is included in the computation. Simple linear regression was used with the involvement in design (UINVD) as an independent variable and user perception of usefulness (UPTU) as the dependent variable. The result was a highly significant regression coefficient. This means that when a user is involved in the design of IT, he or she perceives the system as more useful.

Research Question 2

Does a relationship exist between the user hierarchical position and his/her involvement in the design and implementation of IT? A major task of this study was to

uncover the differential role the hierarchical position of the user plays in involvement in design and implementation of IT. Utilization of Pearson correlation yielded insignificant results regarding the involvement in design and implementation. Employment of Spearman's correlation resulted in two modest and statistically insignificant coefficients for the relationships between involvement in design and user hierarchical position, and involvement in implementation and user hierarchical position.

Research Question 3

Does a relationship exist between the user hierarchical position and his/her perceived usefulness of IT? Pearson correlation coefficient (0.380) was significant (p = .005) for the relationship between user hierarchical position and the perception of usefulness. The obtained Spearman rho correlation coefficient was 0.493 and highly significant at p = 001. This result indicated the existence of strong relationship between user perception of usefulness of IT and user hierarchical position in the bank. This means that users who occupy higher hierarchical position in the bank regard the system as more useful than those who occupy lower hierarchical position.

Research Question 4

Does a difference exist between males and females regarding the user involvement in the design and in the implementation of IT? The t-test was used to answer this question. The results indicate that the t values are not significant at p = 0.05, and it was concluded that there was no difference between males and females in this regard.

Research Question 5

Does a difference exist between males and females regarding the user perceived usefulness of IT? The researcher applied the t-test to answer this question. The obtained results indicated the difference between male-and-female users in perceived usefulness of IT was insignificant. In other words, both female and male users viewed the usefulness of the IT equally. It might be plausible to relate this conclusion to the standardized services of the bank and the adaptation of the existing information system (IS) to such services.

Research Question 6

Does a relationship exist between the user involvement in the design, implementation, and perception of usefulness of IT and years of service in the bank? Of the three variables, only the relationship between user perceived technology usefulness and number of years of service with the bank yielded significant correlation coefficient (0.292). The same applied to regression coefficient (0.524), where user perceived technology usefulness is the greatest and the most significant (p=04). The coefficient of determination of perceived usefulness with years of service in the bank was also the highest.

Research Question 7

Does a relationship exist between the user involvement in the design, implementation, and perception of usefulness of IT and years of experience in the banking business? Just like the results of Research Question 6, the results of Research Question 7 showed that the highest and most statistically significant Pearson correlation

was for the relationship between user perceived technology usefulness and number of years of experience in banking business. The same applied to the regression coefficient. In fact, the obtained results indicated that experience with banking business is a better indicator for UPTU than that of experience with the bank.

Discussion and Conclusion

The answer to Research question 1 indicated that the more the users were involved in the design phase of SDLC, the more they perceived the system as useful. However, in a discussion with one of the top management in the bank, it was revealed that no local users (users in the local branches that the author investigated) were involved in SDLC. A significant number of users got low design scores. Another possible explanation for the low design scores was the notion of centralization. This means that decision-making concerning SDLC takes place in the bank headquarter.

This research also uncovered other facts about involving the users in implementation of IT. The majority of users who responded to the questionnaire had low implementation score. This was reflected in the statement of the bank executive mentioned in the above paragraph. The few users who got high scores regarding involvement in design and involvement in implementation might have thought the researcher expected them to be involved, or even find it more socially appealing to appear as being involved.

Understanding the relationship between user involvement in the design, implementation and usefulness of IT is the cornerstone for the study of IT and its management in organizations (Todd & Benbassat, 2000, p.1). Generally, the obtained

results were consistent with those of Franz and Robey (1986, p.340) who pointed out that user involvement in design and implementation are related to the perception of usefulness of the system. Like Franz and Robey (1986), this study revealed that involvement in the design is strongly related to the perception of usefulness of IT system. The data at hand show that most users have low scores in both the design and implementation (Figures 4.7 and 4.8). These results support an informal discussion between the author and an executive in the bank in which the executive revealed that local users are not involved in the SDLC (design phase and implementation phase). The fact that some users reported involvement in design and implementation is puzzling. Do users lie and why? It appears that users do lie intentionally or unintentionally. Users may think that they are involved. Those users may be involved in something. It could be meetings that take place in the bank headquarter office of the bank to discuss something that relate to IT or in something else. A user who is involved in committees may regard self as involved in SDLC (design and implementation). Some users may be diluted. Those users who lie intentionally are thinking that the researcher is expecting them to be involved. Some others think that it is more socially accepted to be involved (Baker, 1994). Coping theory enter into play in this regard. Beaudry and Pinsonneault (2005) pointed out that technology creates a multitude of expected and unexpected users reaction. Beaudry and Pinsonneault (2005) define coping as follows: “Coping deals with the adaptational acts that an individual performs in response to disruptive events that occur in his/her environment”. Users anxiety response to technology takes different forms. In the context of this study, the reaction of users to this survey (a technology event) is to make believe that they are involved. Some users

have fantasy of being important and involved. When reporting the involvement, it becomes their reality.

In Research Question 2, the hierarchical position of the user did not make a difference in involvement in design or implementation of IT. Franz and Robey (1986) reported no relationship between different levels of IT managers and their involvement in design and implementation. For the current research, the sample size in the higher hierarchical levels was small, 3 executives and 11 upper management …etc. (see Table 4.6). A larger sample might reveal different results. Giving the facts and results of this research, there is not relationship between the hierarchy of the user and his/her involvement. This confirms the land mark informal conversation that revealed that users in the two branches investigated.

Both Research Questions 3 uncover the fact that bank employee in different hierarchical positions in the bank appeared to view the usefulness of the system in varying degrees. The utilized hierarchical ranking and the positive correlation implies that those in senior positions in the bank appeared to appreciate usefulness of the IT system more than those in subordinate positions. However, higher hierarchical users are those users who have more experience with the bank and in the banking business. Hence it is difficult to determine whether the users in high hierarchical positions see the IT system as more useful because of their experience or because they are in control. Further studies are needed to clarify and elaborate this point.

Research Questions 4 & 5 showed that the differences between males and females regarding design scores, implementation scores, and the perception of usefulness scores

were not significant. In spite of that, the male means were consistently higher than female means (Tables 4.18 & 4.19). The nonexistence of statistically significant differences could be that banking tasks are mostly standardized in a way that fosters the equality between males and females. On the other hand, the consistent higher scores of males might indicate that males feel that they are more in control of situations. In addition males occupy higher positions in the hierarchy of the bank. This can help them feel more involved than females. Finally, a larger percentage of males might lead to different findings.

The results of Research Questions 6 and 7 showed insignificant relationships between the number of years of service in the bank, and the number of years of experience in the banking business on one hand and involvement in design and implementation on the other hand. The nonexistence of relationships might be related to the phenomena of centralization/decentralization of IT, a variable that is beyond the scope of this study. The absence of this relationship might be a result of commissioning the IT service to an external provider.

The relationships that appear between years of service in the bank and usefulness of IT, and between years of experience in banking business and the perception of usefulness of IT give support for the findings obtained by Mahmood et al. (2000). The rationale for these relationships could be that more years of service in the bank and experience in the banking business lead to becoming familiar with infrastructure of IT available in the work environment. This familiarity results in “perceived ease of use and perceived usefulness…if the users perceive the system to be easy to use, they need less

effort to use it. Hence, they will have more time for other tasks. Both Research Question 6 & Research Question 7 revealed that the experience in banking business is superior to the years of service in the bank. Experience in banking business connotes diversified expertise that is required for handling business intelligence in information driven society. In the United States bank merger movement took place in the 1980s. These mergers included "government-aided acquisition of savings and loans" (Rapp, 2002, p.227). The author believes that it was for these reasons that a strong relationship existed between the user's perception of usefulness of IT and years of experience in the banking business.

Recommendations

1. Future investigators may follow up their researches regarding the IT usefulness with users and managers interviews. This will help the researcher understands what exactly is behind the answers to the questions.
2. Researchers may venture far and beyond the traditional variables used in the available literature. The variable experience is extremely promising and may help pinpoint what satisfy users and lead to the success of IT.
3. Technology partnership between educators and businesses could foster instruction that is directed to a given technology that interest a particular industry. This will render user confidence and foster their appreciation and enjoyment of the technology, then see it as useful and successful.
4. Researchers must also study the structure and the leadership of the organization within which the technology is to be investigated.
5. Qualitative research may complement the quantitative approach and expand our

knowledge concerning the perception of usefulness of IT systems.

The robust strong positive relationship between years of experience and the perception of usefulness gives a new and more focused perspective on training users. The author suggestions for managers and practitioners are:

1. Innovative training, mentoring, and apprenticeship will certainly bestow high morale, better attitudes and favorable perception of usefulness of information technology and the consequential success of the establishment. Human resource management must come closer to a revolution in staffing, teaching, and taking a holistic approach to training the precious human resource.
2. IS managers should take notes with all new kinds of technology training, in house training, vendor training and many others. Sometimes managers have to adjust and tailor or match different types of training with different users.

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APPENDIX A

APPROVAL LETTERS FOR THE STUDY

Mississippi State University

CERTIFICATION OF HUMAN SUBJECTS EDUCATION

Sanabel El-Attar
ISLWD
112 Dunbrook Dr.
Starkville, MS 39759

Certification Expires: 6/25/2009

IRB Training Certification ID #3682.

DESCRIPTION OF INVESTIGATOR EDUCATION

Beginning in July 2000, the Mississippi State University Office of Research and the Institutional Review Board (IRB) implemented a required training program for all investigators who use or plan to use human subjects in research.

Sanabel El-Attar successfully completed the Basic CITI* Course in the Protection of Human Research Subjects for Social and Behavioral Research by completing the following required modules on 6/25/2006.

- Introduction to the Protection of Human Subjects in Research through the Belmont Report
- History and Ethical Principals
- Defining Research with Human Subjects
- The Regulations and the Social and Behavioral Sciences
- Assessing Risk in Social and Behavioral Sciences
- Informed Consent
- Privacy and Confidentiality
- Links to Ethical Codes and Regulations of Human Subjects in Research

In addition to completion of the CITI Basic Course, all investigators conducting human subjects research at MSU should download and review the IRB Investigator's Manual at http://www.msstate.edu/dept/compliance/irb/irbpolicy.htm. The Investigator's Manual contains valuable information about the submission process, as well as a section on Frequently Asked Questions.

Every three years, investigators will be required to complete additional training and a new certification will be issued at that time.

Michelle Denny
AUTHORIZED IRB REPRESENTATIVE

6/26/06
Date

*CITI is the Collaborative IRB Training Initiative developed by the University of Miami.

June 27, 2006

Mr. Buddy Staggers, President
BancorpSouth, Starkville
P. O. Box 1448
Starkville, MS 39760

Dear Mr. Staggers,

Ms. Sanabel El-Attar is a Ph. D. student in the Department of Instructional Systems and Workforce Development. The research topic of her doctoral dissertation is information technology (IT) in the banking industry. Specifically, Sanabel's interest is in the relationship between both the position of users and the degree of their involvement in the design and implementation of the information system and its perceived usefulness.

I would greatly appreciate it if you would permit Sanabel to survey all information technology users in the bank by facilitating the administration of the designed questionnaire. Selection of BancorpSouth for this study is based on its significant position among the major banks in the country and mainly in Mississippi. A preliminary copy of the questionnaire is attached for your information. The obtained data will be utilized solely for Sanabel's dissertation of which a copy will be sent to you when it is completed.

In the meantime, the confidentiality of the data given to Sanabel will be, of course, guaranteed. If you have any questions or comments about this matter, please call (662) 325-2281 (Dr. Olinzock, Head of the Department, or Dr. Okojie, Sanabel's Academic Advisor).

Thank you for your generous cooperation.

Mabel Okojie

Dr. Mabel CPO Okojie, Advisor/Dissertation Director
Associate Professor
Department of Instructional Systems, Leadership &
Workforce Development
Mississippi State University

July 10, 2006

Dr. Mabel C. Okojie
Department of Instructional System, Leadership &
Workforce Development
College of Education
Mississippi State Universty
Post Office Box 9730
Mississippi State, MS 39762

Dear Dr. Okojie:

This is in response to your letter of July 10, 2006. The mentioned letter requested permission for Sanabel El-Attar to carry out a survey in BancorpSouth of Starkville for her research on information technology as part of her academic work toward a doctoral degree.

I hereby grant Mrs. El-Attar the requested permission. It is our understanding that confidentiality will be maintained concerning the data gathered.

Sincerely,

Buddy Staggers, President
BancorpSouth, Starkville

July 10, 2006

Dear Respondent,

Thank you for responding to this questionnaire. I am a doctoral candidate at Mississippi State University (MSU). My doctoral research investigates the relationship between user's involvement in the development of information system and the perceived usefulness of the system. The fifty Bancorp employees in Starkville are the respondents for the study.

Your participation is voluntary and your decline to participate has no negative effect on your career or interpersonal relationships. Moreover, your participation will not affect your performance evaluation or job advancement. **If you kindly opt to respond to the questionnaire, you must rest assured that the information you provide will be confidential and neither you nor the bank will be identified in any way.**

It is hoped that this study, together with similar researches, yield recommendations that will assist managers in planning technology for use by workers. Additionally, the researcher is looking into the importance of empowering employees and its effect on the business success.

The success of this study depends on a high rate of return for which your participation is essential. It will take maximum 10 minutes to fill the questionnaire and you are truly appreciated. If you have any questions concerning this questionnaire or the study, please call me at 323-0259, or e-mail me at sanabelelhakeem@hotmail.com.

Once you finish filling out the questionnaire, kindly place it in the tamper proof metal box I have provided for you. I am the only one who has the key to the box. Absolutely, no one of your supervisors will see any filled questionnaire. After processing the questionnaires, it will be locked in a file cabinet at my home. Once my dissertation is approved, the questionnaires will be shredded using my private shredder.

Responding to the questionnaire indicates your consent to use the data in my study and I appreciate that immensely. Please keep this form for your records. If you have any question about your rights as a research subject, you may contact Mr. Miller at MSU Institutional Review Board, telephone 662-325-5220. Thank you for your generous cooperation.

Sincerely,

Sanabel El-Attar

Sanabel El-Attar, Doctoral Candidate
P.O. Box 2213
Miss. State, MS 39762

cc Dr. M.C. Okojie, Major Professor

Mississippi State University

August 1, 2006

Sanabel El-Attar
112 Dunbrook Dr.
Starkville, MS 39759

RE: IRB Study #06-183: User's Involvement and Perceived Usefulness of Information Technology

Dear Ms. El-Attar:

The above referenced project was reviewed and approved via expedited review for a period of 8/1/2006 through 7/15/2007 in accordance with 45 CFR 46.110 #7. Please note the expiration date for approval of this project is 7/15/2007. If additional time is needed to complete the project, you will need to submit a Continuing Review Request form 30 days prior to the date of expiration. Any modifications made to this project must be submitted for approval prior to implementation. Forms for both Continuing Review and Modifications are located on our website at http://www.msstate.edu/dept/compliance.

Any failure to adhere to the approved protocol could result in suspension or termination of your project. Please note that the IRB reserves the right, at anytime, to observe you and any associated researchers as they conduct the project and audit research records associated with this project.

Please refer to your docket number (#06-183) when contacting our office regarding this project.

We wish you the very best of luck in your research and look forward to working with you again. If you have questions or concerns, please contact me at jmiller@research.msstate.edu or by phone at 662-325-5220.

Sincerely,

R. Dwight Hare
Chairman

cc: Mabel Okojie

Office of Regulatory Compliance
P. O. Box 6223 • 8A Morgan Street • Mailstop 9563 • Mississippi State, MS 39762 • (662) 325-3294 • FAX (662) 325-8776

From: "Franz, Charles" <FranzC@missouri.edu>
To: <mattar@ra.msstate.edu>, <mokojie@colled.msstate.edu>
Date: 10/24/2006 2:27:56 PM
Subject: RE: test

Dear Mabel,

Sanabel El-Attar has my permission to use my questionnaire from the Franz and Robey article from Decision Sciences.

Chuck Franz...

Charles R. Franz
Associate Professor of Management
College of Business
325 Cornell Hall
University of Missouri-Columbia
Columbia, Missouri 65211
Tele: 573-882-7637
Fax: 573-884-6857
Fax: 573-882-0365 (alternate fax)
e-mail: franzc@missouri.edu
College Web Page: business.missouri.edu

From: Franz, Charles
Sent: Tuesday, October 24, 2006 2:26 PM
To: 'mattar@ra.msstate.edu'
Subject: FW: test

Charles R. Franz
Associate Professor of Management
College of Business
325 Cornell Hall
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Columbia, Missouri 65211
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From: Franz, Charles
Sent: Tuesday, October 24, 2006 2:23 PM
To: 'mokojie@colled.msstate.edu'
Subject: test

Charles R. Franz
Associate Professor of Management

APPENDIX B

THE QUESTIONNAIRE

INFORMATION TECHNOLOGY (IT) QUESTIONNAIRE

Thank you for devoting the time to respond to this questionnaire. The questions seek answers for my information technology research for the doctoral dissertation. Your participation is voluntary, and you must rest assured that any information you provide is strictly confidential, and the obtained information is for research purpose only.

SECTION I: General Information

Part 1: Please check (X) in the appropriate space or write in the elicited information.

1. What is the highest level of education you have completed?

   _____Less than high school
   _____High school
   _____College (2-year degree)
   _____Bachelor's degree
   _____Master's degree
   _____Doctorate's degree
   _____Other (please specify)_____

2. What is your job title? _____

3. Sex: Male _____ Female _____

4. How long have you been with this bank? _____

5. How long have you been in your current position? _____

6. How long have you been in banking business? _____

7. How many years have you been working with computerized information system? ___

Part 2: Please circle the letter that indicates your response.

8. I consider myself (please circle one choice):

   a) A clerical or secretarial b) A supervisor c) A manager or professional

   b) d) An executive e) Other (please specify)_____

NOTE: A system refers to any integrated technologies in the work place that are utilized to facilitate the provision of needed information as required by daily business activities.

SECTION II: Research Indicators

Part 1: User Involvement (Design Phase). Please indicate your response by circling the number that reflects your feeling or belief about the statements below using the following scale:

0 = Do not know (DK) 1 = Not at All (NA) 2 = Very Little (VL) 3 = Little (L)
4 = Moderately (MO) 5 = Much (M) 6 = Very Much (VM)

Item #	Questionnaire Item	DK 0	NA 1	VL 2	L 3	MO 4	M 5	VM 6
9.	During the design phase, to what extent did you (or the user group), rather than the analyst, take the initiative (or the lead) to explain or clarify your information needs?	0	1	2	3	4	5	6
10	During the design phase, to what extent did you (or the user group), rather than the analyst, guide, direct, and lead the process of specifying and/or clarifying the input requirements and details for this system?	0	1	2	3	4	5	6
11	During the design phase, to what extent did you (or the user group), rather than the analyst, guide, direct, and lead the process of specifying and/or clarifying the output requirements and details for this system?	0	1	2	3	4	5	6
12	During the design phase, to what extent did meetings between users and analyst consist of questions and answers led by the analyst rather than the users?	0	1	2	3	4	5	6
13	During the design phase, to what extent would you say that the analyst, rather than the user, assumed the major responsibility for making sure this system satisfied your stated needs and objectives?	0	1	2	3	4	5	6
14	During the design phase, to what extent were you, rather than the analyst, the dominant influence in guiding and directing the planning and design phase of this system?	0	1	2	3	4	5	6

SECTION II, Continued

Part 2: User Involvement (Implementation Phase). Please indicate your response by circling the number that reflects your feeling or belief about the statements below using the given scale:

0 = Do not know (DK) 1 = Not at All (NA) 2 = Very Little (VL) 3 = Little (L)
4 = Moderately (MO) 5 = Much (M) 6 = Very Much (VM)

Item #	Questionnaire Item	DK 0	NA 1	VL 2	L 3	MO 4	M 5	VM 6
15	During the implementation stage, to what extent did you (or the user group), rather than the analyst, take the initiative (or the lead) to explain or clarify your information needs?	0	1	2	3	4	5	6
16	During the implementation, to what extent did you (or the user group), rather than the analyst, guide, direct, and lead the process of specifying and/or clarifying the input requirements and details for this system?	0	1	2	3	4	5	6
17	During the implementation stage, to what extent did you (or the user group), rather than the analyst, guide, direct, and lead the process of specifying and/or clarifying the output requirements and details for this system?	0	1	2	3	4	5	6
18	During the implementation stage, to what extent did meetings between users and analysts consist of questions and answers led by the analyst rather than the users?	0	1	2	3	4	5	6
19	During the implementation stage, to what extent would you say that the analyst, rather than the users, assumed the major responsibility for making sure that this system satisfies your stated needs and objectives?	0	1	2	3	4	5	6
20	During the implementation phase, to what extent were you, rather than the analyst, the dominant influence in guiding and directing the technical aspects of this system such as file design, data origin, and programming?	0	1	2	3	4	5	6
21	During the implementation phase, to what extent were You, rather than the analyst, the testing of that system?	0	1	2	3	4	5	6

SECTION III: Perceived Usefulness of Information Technology (IT)

Please indicate your response by circling the number that reflects your perception about the statements below using the given scale:

0 = Do not know (DK) 1 = Not at All (NA) 2 = Very Little (VL) 3 = Little (L)
4 = Moderately (MO) 5 = Much (M) 6 = Very Much (VM)

Item #	Questionnaire Item	DK 0	NA 1	VL 2	L 3	MO 4	M 5	VM 6
22	To what extent do you actually use this system compared to your original expectation?	0	1	2	3	4	5	6
23	To what extent could you get along without the use of this system?	0	1	2	3	4	5	6
24	To what extent does this system assists you in performing your job better?	0	1	2	3	4	5	6
25	To what extent did you get along better on your job before this system was implemented?	0	1	2	3	4	5	6
26	To what extent do you actually use reports or output that are provided to you by the system?	0	1	2	3	4	5	6
27	To what extent does this system overload you with more data than it seems you can possibly use?	0	1	2	3	4	5	6
28	To what extent does this system provide you with reports that seem to be just about exactly what you need?	0	1	2	3	4	5	6
29	To what extent do you understand what this system does in assisting you with your job?	0	1	2	3	4	5	6
30	To what extent is this system troublesome for you or difficult to Operate or to interact with in order for you to get information to accomplish your job?	0	1	2	3	4	5	6
31	To what extent would you like this system to be modified or redesigned all over again from the beginning?	0	1	2	3	4	5	6
32	To what extent is this system actually used compared to the total number of people who potentially could be using it?	0	1	2	3	4	5	6

SECTION IV: Nature of Decision Making

Please indicate your response by circling only one number that reflects your chosen answer about the statements below using the given scale:

0 = Do not know (DK) 1 = Not at All (NA) 2 = Very Little (VL) 3 = Little (L)
4 = Moderately (MO) 5 = Much (M) 6 = Very Much (VM)

Item #	Questionnaire Item	DK 0	NA 1	VL 2	L 3	MO 4	M 5	VM 6
33	Most of my decisions on the job are repetitive and routine	0	1	2	3	4	5	6
34	Most of my decisions on the job are simple and/or straightforward.	0	1	2	3	4	5	6
35	A definite procedure has been worked out for handling these types of decisions (i.e., they are not novel each time they Occur).	0	1	2	3	4	5	6
36	Decisions I make daily on my job are unique and occur frequently.	0	1	2	3	4	5	6
37	Decisions I make on my daily job are, mainly, concerned with detecting problems or potential Problem areas (for example, declining loans, expenses out of line, delinquent accounts).	0	1	2	3	4	5	6
38	I am generally satisfied with my job.	0	1	2	3	4	5	6

THANK YOU FOR YOUR COOPERATION

Further comments or suggestions are welcomed.