

https://dspace.org/

The role of user involvement in the success, or otherwise, of system development within a major bank in South Africa

Morrison, Magda

2014-06-12
http://hdl.handle.net10539/14775

Downloaded from a DSpace repository. https://dspace.org/

University of the Witwatersrand
Faculty of Commerce
Department of Information Systems

The Role Of User Involvement In the Success, Or Otherwise, Of Systems Development Within A Major Bank In South Africa

A research report submitted to the University of Witwatersrand, Faculty of Commerce, in partial fulfilment of the requirements for a Master's in Information Systems

Submitted by: Magda Morrison
Student number: 9612355X
Date of submission: 11 December 1998
Supervisor: A Heafield

DECLARATION

I, the undersigned, hereby declare that the work contained in this research report is my own, original work and that I have not previously in its entirety or in part submitted it at any university for a degree.



Magda Morrison

10 December 1998

ACKNOWLEDGEMENTS

I would like to thank the following people:

All the staff who gave their time so freely for the interviews necessary for this research report.

Zac Jordaan and Hester Mey for proof reading the document and for their invaluable comments.

Maryna Fouche for helping with transcribing all the taped interviews

A special thanks to Alison Heafield for her help and comments as my supervisor.

ABSTRACT

User involvement is widely regarded as important in the development of systems. User involvement and user participation in the system development process was researched extensively since the sixties. Previous studies concentrated on various aspects of user involvement and participation and its influence on successful system implementation. Despite all these studies, the positive effect of user involvement and participation on system success has not been proven consistently.

This research report examines and analyses four different system development projects in a major bank in South Africa with the objective of determining different levels of user involvement and the effect this involvement has on the success, or otherwise, of the actual systems. It also establishes an understanding of those issues regarding the involvement of users during the systems development life cycle and gives insight into the complexity of these issues. The focus is on the role users' play in the system development and implementation. The important issues involving user contributions and objectives about expectations and expectation levels of the users and the system developers are also examined.

The results stress the impact of user involvement on the development of systems. The research emphasises the role the users played in system development and implementation. Questions, such as what benefits are expected from the user involvement, what benefits will in fact be achieved and should no benefits result, the possible reasons were for the lack of achievement, will be answered. The results also provides evidence that even though a system is in use, it does not necessarily prove to be successful and that user participation plays an important role in the SDLC.

TABLE OF CONTENT

LIST OF TABLES 4

LIST OF FIGURES 5

CHAPTER 1: INTRODUCTION AND BACKGROUND 6

1.0 INTRODUCTION AND BACKGROUND 6
1.1 INTRODUCTION TO SYSTEMS DEVELOPMENT LIFECYCLE 7
1.1.1 The measurement of systems development success 8
1.1.2 User involvement and a measurement of success 9
1.2 STATEMENT OF THE PROBLEM 9
1.3 AIMS AND OBJECTIVES OF THE RESEARCH 9
1.4 OUTLINE OF THE RESEARCH REPORT 10
1.5 SUMMARY 10

CHAPTER 2: LITERATURE REVIEW 11

2.0 INTRODUCTION 11
2.1 BACKGROUND 12
2.2 DEFINITION OF USERS 12
2.3 DEFINITION OF A SUCCESSFUL SYSTEM 13
2.4 GENERAL DEFINITIONS 15
2.5 USERS' ROLE DURING SYSTEMS DEVELOPMENT 15
2.5.1 User involvement: 15
2.5.2 Attitude: 17
2.5.3 Usefulness: 17
2.5.4 Usability: 18
2.5.5 User satisfaction: 19
2.5.6 User acceptance: 20
2.5.7 User participation: 21
2.5.8 Relationships 21
2.5.9 Communication: 22
2.5.10 User led: 23
2.5.11 Business management involvement: 24
2.5.12 Right level of user: 24
2.5.13 Life cycle: 24
2.5.14 Evaluation: 26
2.5.15 Prototyping: 26
2.5.16 Testing: 26
2.5.17 Implementation: 27
2.5.18 Training: 27
2.6 SUMMARY 29

CHAPTER 3: RESEARCH METHODOLOGY 30

3.0 INTRODUCTION 30
3.1 AIMS AND OBJECTIVES 31
3.2 JUSTIFICATION OF A QUALITATIVE RES[illegible]OLOGY 32
3.3 INTERVIEW SAMPLE 33

3.4 METHOD OF SELECTING THE INTERVIEWEES INVOLVED: 34
3.5 METHOD OF SELECTING THE FOUR PROJECTS. 34
3.5.1 Description of the four projects involved: 35
3.5.1.1 Project 1: Smartcard project: 35
3.5.1.2 Project 2: Debit card project: 35
3.5.1.3 Project 3: Debit/retail card project: 36
3.5.1.4 Project 4: Electronic banking - new functions - project: 36
3.6 DATA COLLECTION STRATEGY 37
3.7 DATA ANALYSIS STRATEGY 37
3.8 SUMMARY 38

CHAPTER 4: PRESENTATION AND ANALYSIS OF EVIDENCE 39

4.0 INTRODUCTION 39
4.1 DEFINITION OF A SUCCESSFUL SYSTEM 40
4.2 WHO TO INVOLVE AND TO WHAT EXTENT 42
4.3 THE PROJECT LIFE CYCLE 44
4.4 GENERAL COMMENTS AND OPINIONS 49
4.5 SUMMARY 53

CHAPTER 5: SUMMARY AND CONCLUSION 54

5.0 INTRODUCTION 54
5.1 EXAMINATION OF RESEARCH QUESTIONS 54
5.1.1 Impact of user involvement on systems development 54
5.1.2 Users role in system development and implementation 55
5.1.3 Benefits expected from user involvement 56
5.1.4 Benefits achieved by user involvement 56
5.1.5 Benefits not achieved by user involvement 57
5.2 MANAGEMENT GUIDELINES 57
5.3 AIMS AND OBJECTIVES OF THE RESEARCH 58
5.4 LIMITATIONS OF THE RESEARCH 59
5.4.1 Sample size of the number of projects 59
5.4.2 Sample size of the number of interviewees 59
5.4.3 Analysis and presentation of the data 59
5.4.4 Questionnaire interpretation 59
5.4.5 Limitation of time 59
5.5 AREAS FOR FURTHER RESEARCH 59
5.6 SUMMARY AND CONCLUSION 60

LIST OF REFERENCES 62

APPENDIX A (1): USERS' QUESTIONNAIRE 68

APPENDIX A (2): SYSTEM DEVELOPERS' QUESTIONNAIRE 71

APPENDIX B (1): INDIVIDUAL USER QUESTIONS RESULTS 74

APPENDIX B (2): INDIVIDUAL SYSTEM DEVELOPERS QUESTIONS RESULTS 83

APPENDIX C (1): A TRANSCRIPT EXAMPLE OF 1 USER INTERVIEW 92

APPENDIX C (2): A TRANSCRIPT EXAMPLE OF 1 SYSTEMS DEVELOPER INTERVIEW..... 97

LIST OF TABLES

Table 1 – Smartcard project information 35
Table 2 – Debit card project information 36
Table 3 – Debit/Retail card project information 36
Table 4 – Electronic banking – new functions – project information 36
Table 5 – Questionnaire breakdown 37

LIST OF FIGURES

Figure 1 - V-model.....8
Figure 2 - The aspects of the user role and involvement in the SDLC.....11
Figure 3 - Roadmap through research 30
Figure 4 - Data source breakdown. 39

CHAPTER 1: INTRODUCTION AND BACKGROUND

1.0 Introduction and background

User involvement and participation in the development of Information Systems (IS) has long been considered a critical factor for the successful implementation of such information systems (Kappelman and Mclean 1991). This critical factor, that is user involvement and user participation in the system development process, has been researched extensively since the sixties (Doll and Torkzadeh 1989). These studies concentrated on various aspects of user involvement and participation and the influence they had on successful system implementation (Ives and Olson 1983). Despite all these studies, the positive effect of user involvement and participation on system success has not been proven consistently (Doll and Torkzadeh 1989). According to Barkie and Hartwick (1994:b) research has failed to demonstrate clearly the benefits of user participation and involvement.

This research report investigated the role of user involvement in the success, or otherwise, of system development.

Friedman (1993) claims

> *"Expressions of concern over user relations have been expressed for as long as computers have been imaginable."*

The emphasis of initial research was placed mainly on user relationship with IS in the early 1980s (Synnott and Gruber 1981, Friedman 1993). User relationships can be seen as the interaction between the system developers and the users. Since the 1990s the emphasis has shifted to user satisfaction (Remenyi *et al.* 1995, Friedman 1993) instead of concentrating only on user relationships. McKeen *et al.* (1994) claim that user participation has been widely touted by the MIS (Management of Information Systems) community as means of improving user satisfaction within system development, but they also feel that this statement has not been substantiated consistently in empirical literature.

The need for definite or specific areas that focus on user involvement has been emphasised. Cash *et al.* (1992) maintain that users should participate specifically in the development and implementation of an Information Technology (IT) plan that sets new technology priorities and evaluation of a portfolio of projects based on the company strategy. Tait and Vessey (1988) allege that users are involved to the greatest extent in the implementing of complex systems. They also speculated on whether decreasing user involvement could reduce the cost of less complex system development and, at the same time, still maintain same level of success. Barki and Hartwick (1994:b) stress the inclusion of users in the pre-development stages and the post-implementation stages.

Whether user involvement is a success and helpful is debatable. Based on this context the research of user involvement is defined as:

> *" the participation in the development by a member/members of a target user group"* (Tait and Vessey 1988).

According to Doll and Torkzadeh (1989) notwithstanding the large number of studies on the subject of user involvement and participation, the positive effect of participation on system success has not been proved consistently. This was still the case when Barki and Hartwick (1994:a) stated that until recently it had been reported that research had failed to demonstrate clearly the benefits of user participation and involvement. They also stated that using the term "user participation" interchangeably with "user involvement" creates confusion.

There is also a growing awareness of the need for IS development to support true business. For example a legal system was developed unsuccessfully without user participation (Symon 1983, Dunlop and Kling 1991). The support of true business was proposed by Martin (1982) when he commented that only the users truly understand the subtleties of their own applications, particularly when those applications are complex.

An area of importance is checking on past mistakes. Reichheld (1996) maintains that the most useful and instructive learning grows from the recognition and analysis of failure. Quite often users have defected and nobody has investigated the reasons behind such defection.

Literacy is another important area. Ford (1993) avers that a user must be information literate, to know the information structure of his company, the availability of both in-house and external information, and be open to change in technology, although hopefully he will not be travelling in circles.

1.1 Introduction to systems development lifecycle

According to Friedman (1991) the Systems Development Lifecycle (SDLC) is a software development process that suggests a logical sequence of steps in the creation and development of a computer system. The SDLC as a process was defined in the seventies. The SDLC was designed to improve the development process significantly. It also improved measuring and made it easier to measure and reduce the complexity of developing a computer system. The SDLC has undergone a few changes over the years. Edwards et al. (1992) proposed a modern systems development model which they called the V-model. The V-model identifies the various stages and the associated deliverables produced. The phases of the V-model are as follows:

- Initiate
- Needs analysis
- Technical design
- System development

- Integration testing
- Acceptance testing
- System hand-over

The V-model is a starting point for system development and can be modified for different approaches to system development, for example: the inclusion of prototyping. A diagram of the V-model follows:

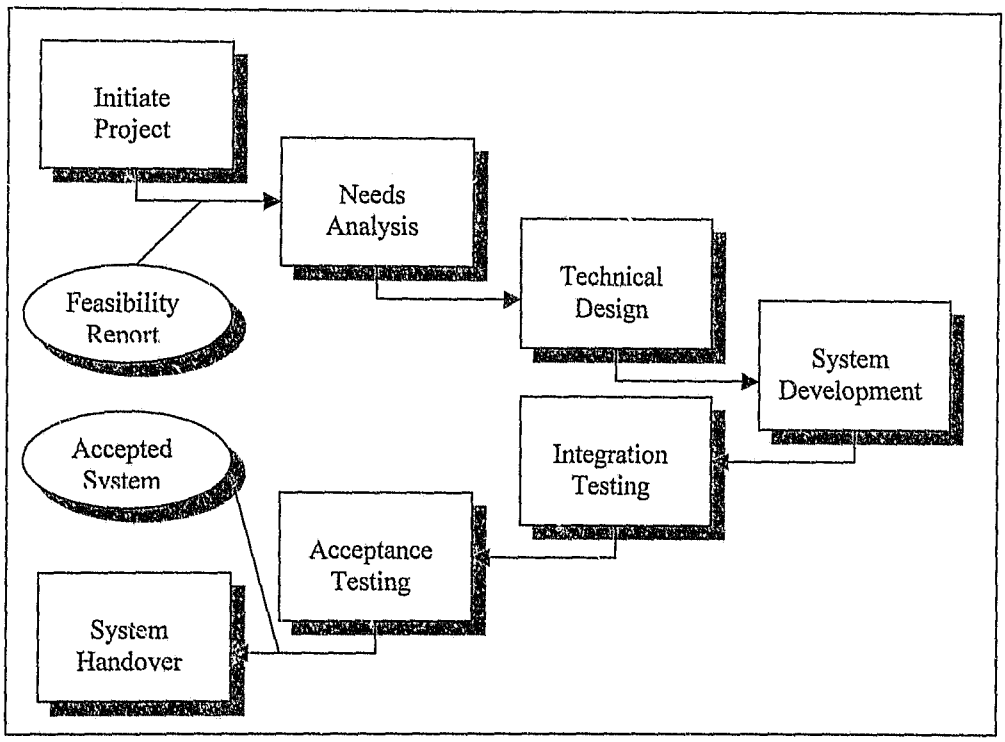


Figure 1: V-model

1.1.1 The measurement of systems development success

In order to measure the success of systems development you need to define a successful system first. The definition of a successful system is covered in detail in chapter 2. For the sake of clarity, the following points are regarded as part of a successful system:

- User satisfaction
- Increase in system usage
- User acceptance
- Provision of quality service to users

These are merely some aspects of a successful system. The measurement of the systems development success is a totally different discussion. Measuring the above

points is not easy. Perceptions, individual feelings and resistance to change, play important roles in the ability to measure the success of system development.

1.1.2 User involvement and a measurement of success

The above section highlights that when measuring the success of a system, a major factor is one of user acceptance. One method of gaining user acceptance is to involve the user in the SDLC. As stated previously, the definition points to a successful system being one of user satisfaction, an increase in system usage, user acceptance and the provision of quality services to users, which can be achieved more easily by user involvement. It does not mean that the system will be successful, but with user involvement the above aspect can be achieved more easily and user needs can be addressed and included in order to come closest to a successful system.

1.2 Statement of the problem

The problem is whether user involvement in the SDLC will influence the success of an implemented system. This involvement includes the way the users are involved and extent to which they are involved. The problem also includes whether user involvement actually does impact on the development of systems and whether any benefits can be derived from their involvement. The question is whether user involvement actually achieves real benefits and to what extent does it achieves real benefits in the SDLC.

1.3 Aims and objectives of the research

The aim of this research is to examine and analyse four of different system development projects in a major bank in South Africa with the objective of determining the different levels of user involvement and the effect of this involvement on the success, or otherwise, of the actual systems.

In adopting the previously-mentioned definition of user involvement, it is important to understand the meaning of the word "*participation*" The research also focused on the role users play in the system development and implementation. Important issues were the user contributions and efforts.

Another aim of this research is to provide some guidelines to management and to contribute to academic literature.

A further consideration examined in the course of the research was the expectations of users and system developers with the involvement of the users and specifically the users and system developers expectation levels. The following questions need to be answered:

- What expectations were met?
- What expectations were not met?

- And what was the cause of the discrepancies in expectation levels? .

In order to achieve these objectives, the research aims to provide evidence that even though a system is in use, it does not necessarily mean it is successful and that user participation does play an important role.

1.4 Outline of the research report

The research report is structured as follows:

Chapter two: Literature review. This chapter discusses the relevant literature in order to develop a theoretical framework of the user's role in system development.

Chapter three: Research methodology. This chapter describes the information gathering by means of semi-structured interviews and the methods used to analyse such information.

Chapter four: Presentation and analysis of evidence. This chapter describes all information gathered and the results obtained in the interviews and the interview analysis. The chapter also analyses the results in order to identify the benefits and problems of user involvement in system development.

Chapter five: Summary and conclusion. This chapter states the conclusion drawn and proposes some managerial guidelines for the involvement of users in future system development projects. An indication of further research in this field is also given.

1.5 Summary

In this chapter some of the background was discussed into the research of user involvement in the systems development life cycle (SDLC). The importance of this study as well as the research objectives and report structure were explained. In the following chapter, a review of the relevant literature used to develop a theoretical framework of the user's role in system development will be outlined.

CHAPTER 2: LITERATURE REVIEW

2.0 Introduction

This chapter reviews some of the relevant and related literature on user involvement in the systems development life cycle. The objective of this review is to establish an understanding of issues regarding the involvement of users in the systems development life cycle and to gain insight into the complexity and issues involved.

Because of the extent of the literature review, it is useful to provide a diagrammatic overview of the literature in order to illustrate relationships between the concepts under discussion.

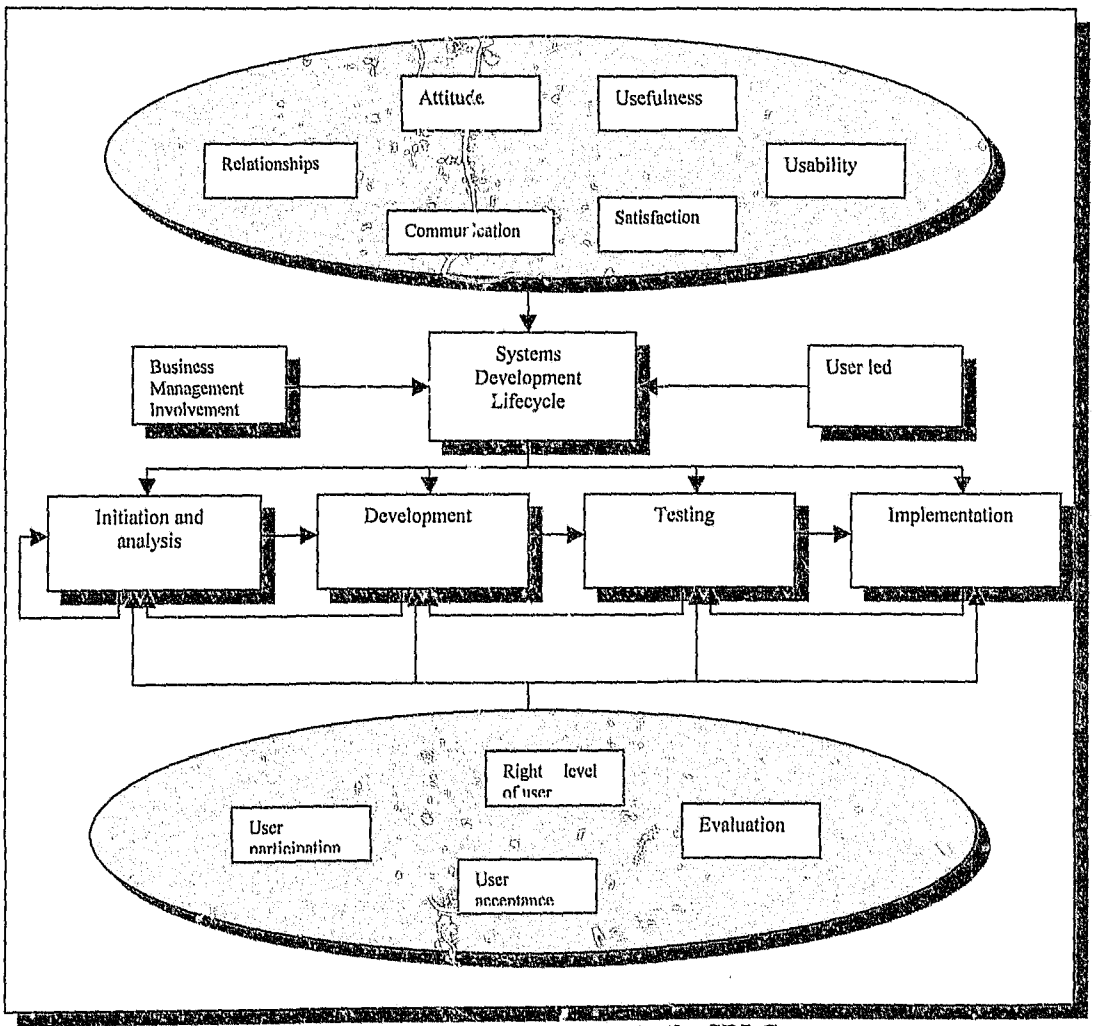


Figure 2: The aspects of the user role and involvement in the SDLC

2.1 Background

User involvement in system development has been an issue for a long time. In the past a multitude of "critical keys" has been defined to evaluate the success of development and implementation of Information Systems (IS). One of the "*critical keys*" to success in information systems lies in the effectiveness of its user relationships (Synnott and Gruber 1981, Martin *et al.* 1994).

User relationships alone are not satisfactory. User relationships focus more on the interaction between the users and the system developers. Turban (1993) sees behavioural and psychological considerations as part of user relationships. Another important factor is user satisfaction. Comparison of user expectations of Information Systems (IS) and the perceived performance thereof, results in an indication of user satisfaction (Remenyi *et al.* 1995, Ives *et al.* 1983, Friedman 1993, Frenzel 1992). This might lead to the involvement of users in development and implementation in order to achieve better user satisfaction.

2.2 Definition of users

A useful starting point for discussing the literature in terms of this research is to examine the definition of a user. It is necessary to point out IS management's particular interest in the impact of computing on the people who actually use the IS in their working environment (Danziger 1986, Campleman 1985, Allen and Scott Martin 1994). They are the people who need to cope with the problems and incorrect representation of the business.

Doll and Torkzadeh (1988) distinguish between primary and secondary users. Primary users are those who make decisions based on the system's output and secondary users are those who are responsible for interacting with the application software. However the authors conclude that the users' role is changing into a combined role, in terms of combining the primary and secondary roles, in which the person who uses the system output should also be involved in developing it. Trauth and Cole (1992) see a user, from a Management Information Systems (MIS) viewpoint, as an individual, a work group, or the entire organisation.

Friedman (1993) classifies users according to the phase of the life cycle in which they are involved. He suggests the following user classifications:

- The patron: This could be the initiator of the system. The person who perceives the need or opportunity for a new system and sets the process in motion. This could also be the person who acts as a type of 'godfather' to the system.
- The client: The person or persons for whom the system is intended. The person/s who will use the system, that is those for whom the system output is ultimately designed.
- Design interactors: The persons involved in the systems design process at specification and the development of the systems.
- End users: The persons who are involved directly in the manipulation of the system in operation.

- Maintenance/ enhancement interactors: The persons who are involved in the further evolution of the system.
- Secondary users: The persons who have been affected by the system, for example: been displaced by the system.

Bjorn-Andersen *et al.* (1986) define an user of a computer system as a person who, either through printed paper or output visually displayed on a screen, receives information he or she may apply in his/her work. Behind the conception of a user lies the assumption that he or she is a member of an organisation and that the computer system is located in this organisation.

Edwards *et al.* (1992) see users as those who want to have the benefit of the use of the completed system. They must be satisfied at the earliest possible stage that the system will deliver the expected benefits and must see evidence of progress.

Another definition of a user comes from Cavaye (1995). He says that the term 'user' is very broad and covers a number of different types of user, ranging from senior management to clerk. Users can be classified according to their use of information or outputs provided by the system.

For the purpose of this research a user is defined as a variety of people who in some way must use the system and who understand the business concerning the system, from physically having to operate the system to having to use reports produced by the system.

2.3 Definition of a successful system

It is important to determine what a successful system is in order to measure it. Tait and Vessey (1988) view a successful system as one in which system usage increases, when system quality is more favourable or when user satisfaction with the information received increases. They also feel that system use is behaviour while user satisfaction is an attitude towards a new system.

McKeen *et al.* (1994) feel that the term "user satisfaction" has been widely used by researchers as a "surrogate of system success". Friedman (1993) states that it is no longer sufficient for systems to be developed with few bugs and within budget; the systems must actually be useful. By useful he means that the users need to be able to do their jobs better or they need to be able to achieve their overall ambitions. However Friedman (1993) states that

> *"This is not easy. One problem is that most systems must be designed to be used by several types of users."*

The success of a system is wider than merely the points mentioned as part of the definition of a successful system. According to Turban (1993) the key to the successful use of a system is in the user interface. He feels that the user acceptance depends on behavioural and psychological considerations. Then there is also the important aspect of demonstrating the fully operational system to the user community. Viewers can become believers.

The importance of a SLA is supported by Frenzel (1992) when he includes a Service Level Agreement (SLA) as part of the success of a system by making it one of the components of his Management by Result program. The component makes a SLA mandatory between system developers and users. The reasoning for the importance of a SLA is to ensure that system developers, users and the organisation are committed to achieving company and user objectives. He sees the SLA as the heart of the 'Management by Result' program. The SLA must include the performance standards as agreed to by the system developers and the users as well as the performance calculations and the methods of reporting unsatisfactory results. It must also include the system developers' costs and performance since cost effectiveness is a common goal. The agreement must achieve a balance between performance, quality and good customer relationship.

The method of delivery of information is not as important to the success of a system as the way in which the information is presented. According to Pitt *et al.* (1995) for a user the information received from a system is paramount and the delivery mechanism secondary. The effectiveness of system developers can be assessed by the capability of the system to provide quality service to its users.

A successful system and its relationship to effectiveness of the system is a very important aspect. Scott (1994) claims that no adequate measuring instrument for information systems effectiveness exists as yet. The findings show the immaturity of this field of study and contribute to the refinement of the measuring instrument both for researchers and practitioners. The need exists for more thought to be given to designing an information system effectiveness-measuring instrument. Part of a successful system is to examine the pre-set objectives for measurement at a later stage. Hamilton S. Chervany (1981) maintains that systems objectives important to users are accuracy, reliability, timeliness in responding to a request, assistance and the adequacy with which the requirements definition is met.

In an effort to create an effective system, Evans *et al.* (1988) define the following major areas:

- Understanding the environment, the functions performed by individuals, relationships between individuals and the functions they perform, and information flow between functions.
- Understanding user needs and potential for fulfilling those needs.
- Determining the utility of information systems.
- Determining the satisfaction level of users of information systems.

The majority of end-users are at a disadvantage when it comes to using a computer system because they are naïve about its general properties. The problem of inadequate knowledge and skills base can be viewed as a general source of inhibition in the successful exploitation of a system (Bjorn-Andersen *et al.* 1986).

Markus and Keil (1994) support the involvement of a user manager in the implementation of a successful system. They allege that situations occur when the users and their managers think systems are turn-key and then blame the system developers when it is not used. Unused systems often work well technically, developers then refer back to the users, saying that they built the technically and

economically feasible part of what the users said they wanted. Situations such as these are especially likely to occur when the true client that is the founder and primary beneficiary of a system is not the manager, but some third party.

Belden (1987) maintains that success in information systems must not be measured on how well one uses the tools but on how well the product created performs. However there are certain criteria a system must meet to be successful. A system can be usable if these criteria are not present, but it will fail eventually. The criteria are as follows:

1. System must be simple and straightforward in design and function.
2. The system must be designed to be as self-regulating and self-monitoring as possible.
3. The system must be delivered to the user complete, in as finished a state as possible. It must be ready to perform its assigned tasks - accurately, expeditiously and reliably. It must not require frequent fixes to make it work.
4. The people who will use it must be prepared to use it when the system is ready to be used.
5. The systems suitability, reliability and overall effectiveness must be measured periodically against obvious and easily understood basis.

For the purpose of this research a successful system is defined as a system that covers the users need, is easy to use, user-friendly and very reliable. The users must have been involved in the system and be committed to and satisfied with its use.

2.4 General definitions

A few general definitions will be discussed to elucidate certain aspects expounded later.

Goldsborough (1994) describes any person who is very fond of computers, including people who are obsessed with computers as "Computerphilic". Conversely he describes people who are fearful of computers as "Computerphobic". Those people who are fearful of technology are describes as "Technophobic", and they are a serious and widespread problem. Young people have less fear of technology than older folks. It is more a factor of exposure. The more exposure, regardless of age, the more comfortable the person is. Nevertheless for people to use technology sufficiently to be comfortable with it such technology must be inviting which makes ease of use a key challenge for designers.

2.5 Users' role during systems development

2.5.1 User involvement:

Baronas and Louis (1988) state that systems implementation represents a threat to users' perceptions of control over their work and a period of transition during which users must cope with differences between old and new work systems. User

involvement is effective because it restores or enhances perceived control. User involvement has been called upon to supplement quality of technical design in the quest for system success.

System introduction is perceived by the user as a period of transition during which the normal level of personal control is threatened. Activities that restore a user perception of personal control during system implementation will contribute to user acceptance and other aspects of system success, e.g. satisfaction with the new system, system usage.

User involvement is predicted to increase user acceptance by:
1. developing realistic expectations about system capabilities
2. providing an arena for bargaining and conflict resolution about design issues
3. leading to system ownership by users
4. decreasing user resistance to change
5. committing users to the system

User involvement is also predicted to increase system quality by:
1. providing a more accurate and complete assessment of user information requirements
2. providing expertise about the organisation the system is to support
3. avoiding development of unacceptable or unimportant features
4. improving user understanding of the system

The involvement of the correct users and the involvement of the right level of users are crucial. The time of involving the users is also vital. Determining the applicable users is not an easy task. The users and the system developers need to comply with specific criteria. Galliers and Baker (1994) concur with this and state that qualified team members and team leaders are scarce. Team members from the user side must feel comfortable with information technology and system developers need to understand the business. Both require excellent communication skills and must have time to participate.

A problem that can occur is involving users too intensively. The involvement of users should be restricted and kept within certain limits. A way to support this and to eliminate unnecessary users can be resolved by determining which users are needed by answering certain specific questions (Wiid 1987).

Kendall and Lyytinen (1992) stress the necessity of adapting characteristics of customer-oriented production research to the software industry. Thierauf (1988) states that the gap in conventional development methods can be overcome by using users at all levels.

Barki and Hartwick (1989) describe user involvement as a subjective psychological state reflecting the importance and personal relevance of a system to a user. High user involvement is said to increase an individual's motivation to process issue-relevant information. The focus should be on user participation rather than on user involvement.

User involvement is defined as participation in the development by a member/members of a target user group (Tait and Vessey 1988).

2.5.2 Attitude:

Emery (1991) asserts that behaviour can be predicted, based on attitudes. Therefore one can measure the satisfaction of an end user with a system (attitude towards object) or his/her satisfaction with using a system (attitude towards behaviour) to predict the person's future behaviour e.g., subsequent use of the system. Because attitudes result from a set of evaluated beliefs, it is important to understand not only the relationship between these psychological constructs, but also the link between attitudes and behaviour. The strength of an attitude-behaviour relationship depends in large measure on the degree of correspondence between attitudinal and behavioural entities. It is through this understanding that one can use attitudinal measures, such as satisfaction to predict certain behaviours.

Chidambaram (1996) points out that other studies of user satisfaction have often ignored the dynamic nature of attitudes. Attitudes form and, in some cases, change. The research designs of many studies fail to acknowledge this fact. With repeated use of a model, relationships will start to strengthen, members will become cohesive and groups will be more satisfied. The author's study suggests that, among users of new technologies, new attitudes may take a while to form and old attitudes will dissipate slowly. The slow change in attitudes is likely a reflection of how strong initially formed opinions can be, especially when they are negative. Therefore it is not surprising when researchers report that computer support hampers relational intimacy, reduces satisfaction and decreases socio-emotional interaction.

2.5.3 Usefulness:

Franz and Robey (1986) claim that usefulness depends on user perceptions. There is also a positive relation between user attitudes and actual use. Therefore, a policy of user involvement is likely to produce favourable perceptions of a system and greater use.

Research done by Dodd and Carr (1994) found that users involvement in design and implementation is related positively to user perception of system usefulness. Active participation by users in the design process instil a sense of ownership in the final product, which produces benefits such as:

1. increased willingness to use the system
2. better system design
3. a more positive attitude about computers in general

Davis (1989) declares that performance gains are often obstructed by user unwillingness to accept and use available systems. He asks what causes people to accept or reject information technology? People tend to use or not use an application to the extent they believe it will help them perform their job better. Even if potential

users believe that a given application is useful, they may, at the same time, believe that the systems is too hard to use and that the performance benefits of usage are outweighed by the effort of using the application. This is referred to as perceived usefulness.

Hendrickson *et al.* (1993) define perceived usefulness as the degree to which a person believes that using a particular system would enhance his or her job performance. Perceived ease of use refers to the degree to which a person believes that using a particular system would be free of effort.

Davis (1989) defined perceived usefulness the same as Hendrickson *et al.* (1993) but says in addition that this definition was derived from the definition of the word useful, which is: capable of being used advantageously.
His definition of perceived ease of use is based on the definition of ease: freedom from difficulty or great effort.

2.5.4 Usability:

Ease of use and usefulness are considered important determinants of system use. Ease of use leads to adoption of system by user (Adams *et al.* (1992))

Appleton (1993) asserts that more businesses are putting time and money into delivering applications that their employers find easier to use. Usability should not just be what users say about software after they have tried it, but also how they actually respond to it.

Gattiker and Howg (1990) allege that the potential future effects of information technology on office-type work and job attitudes are argumented by the labour process theory which suggests that such technology will simplify and de-skill jobs, thereby reducing the quality of work life. Recent occupational changes in the service industry suggest, however, that the above argument may not necessarily apply to work in the office setting. Higher paid office jobs are increasing as a percentage of the total workforce. Such developments in office-type work are generally associated with an increase in job complexity and decision-making, which in turn raises the skill levels required to perform the job-related tasks effectively. In such cases, information technology appears to replace repetitions and unskilled work, but data also suggests that average skilled jobs have been eliminated by information technology. This suggests ab-nominal distribution of (high-skill/low-skill) work.

Gattiker *et al.* (1995) suggest that the lack or low quality of user-friendly documentation of the information system or the software program used as well as lack of user help offered by IS specialists to organisational employees and limited user involvement have contributed to low effectiveness.

Gattiker *et al.* (1995) state that various groups can explain end-user attitudes and these can be measured by measuring the attitudes of employees towards information systems and their value, user friendliness, and flexibility. The groups of variables are:
1. demographics and hierarchical level

2. training
3. skill practice
4. end-user support
5. the extensiveness of IS use in one's daily work-routine

Since the technical concerns of innovation generally precede social considerations, employee attitudes towards new technology are usually assessed only after it has been introduced. However, because new technology is usually introduced primarily to increase efficiency, attitudes towards it should probably be assessed before its introduction; a radical change in work environment may well affect employees attitudes towards their work, and this could reduce productivity, promote absenteeism or have any number of other negative effects (Gattiker *et al.* (1988)).

In many cases the system developers are measured and rewarded for producing systems on time and on budget. Based on the implicit, and often erroneous, assumption that the user managers will take responsibility for ensuring that the systems will be used, the system developers are usually not held accountable for delivering systems that are good (Markus and Keil (1994)).

2.5.5 User satisfaction:

Some key issues mentioned by Remenyi and Money (1994) in their study included the following aspects related to lack of service:
1. unhelpfulness of system developers staff
2. slow response to requests for assistance
3. systems not easy to use
4. poor access to systems
5. incompatibility of hardware and software

Additional factors that are important to user satisfaction are: Users value prompt response and software compatibility between systems. However not to be forgotten is the extent to which systems meet user expectations and are cost-effective (Rushinek and Rushinek (1986)).

Leyland *et al.* (1995) claim that users do not just want a machine; they rather want a system that satisfies their personal computing needs. Therefore, the information system department's ability to supply installation assistance, product knowledge, software training and support as well as and online help will impact on the relationship between system developers and users. Service quality is an important aspect when establishing of systems effectiveness. The prime determinants of expected service quality are word of mouth communication, personal needs, past experiences and communications by the service provider to the user. Users talk to one another about their relationships with the system developers. These discussions help to fashion user expectations of systems departments' service. Also, prior experience is a key moderator of expectations. Users may adjust or raise their expectations based on previous service encounters.

DeLone and McLean (1992) allege that user satisfaction is associated with user attitudes towards systems. Consequently user satisfaction may be biased by user computer attitudes. User satisfaction should always be associated with user attitudes. Measuring user information satisfaction includes three information quality constructs:

- informativeness which consists of
  - relevance
  - comprehensiveness
  - recentness
  - accuracy
  - credibility
- accessibility which consists of
  - convenience
  - timeliness
  - interpretability
- adaptability

User satisfaction will be related positively too higher levels of user leadership and control during the SDLC and will commit users to systems by allowing them to take ownership. A facilitative rather than controlling approach should be taken to the management of systems development projects to ensure a more successful system implementation (Allingham and O'Connor (1992)).

Remenyi and Money (1994) briefly describe the definition of user satisfaction as the gap between what the users perceive (i.e. user expectation) as being important to them and the level of performance they believe will be delivered by the information systems department.

DeLone and McLean (1992) define user satisfaction as the Recipient response to the use of the output of an information system.

2.5.6 User acceptance:

To achieve user acceptance, one must to take into consideration the following: Perceptions, attitudes and satisfaction. These concepts are related but have different meanings.

Perceptions are beliefs about an object and related objects. Attitude results from the evaluation of those beliefs. Satisfaction includes both perceptions and attitudes about an information system. Satisfaction in a given situation is the sum of one's feelings or attitude toward a variety of factors affecting that situation (Galletta and Lederer (1989)).

2.5.7 User participation:

It is critical to look at user participation. Without user participation a system will definitely be unsuccessful. The type of user to become involved and to actually participate is very important. Participation is a process in which influences are shared among individuals who are otherwise hierarchically unequal. The results of Wagner (1994)'s research reveals that participation influences performance and satisfaction.

Barki and Hartwick (1989) describe user participation as a set of behaviours or activities performed by users in the system development process.

2.5.8 Relationships

Friedman (1993) expresses concern about user relationships and the difference in perspective from the user's viewpoint and that of the systems developer. He lists the differences per category of user. He also claims that the concern expressed from the user perspective about computer systems, system developers and the systems development process is multitudinous. Users should be more involved than merely specifying their requirements. They should be the measure of success at the end.

Lawrence and Low (1993) maintain that good management of relationships with end users would appear to be essential. Good management involves ensuring that the users understand the working of the user representative group and have faith in the group's ability to represent their best interests in the systems development process. The user representative group must ensure that the users feel involved and adequately represented in the systems development process, understand the systems objectives, receive adequate training, and are provided with adequate system documentation.

Dodd and Carr (1994) state that it is essential to include users from start to finish in order to reduce conflict between users and system developers. Conflict stems from the understanding of certain participants of what constitutes a successful system. According to the authors the analysts will be judged to be successful if they deliver on time and on budget a system that meets user-approved specifications. Therefore, their motivation is to push users to approve specs that minimise requirements. However the user will always push for more than originally specified.

Feeny and Willcocks (1998) claim that the challenge of business and IT vision is to address the need for two-way strategic alignment between business and technology. A company must focus information system efforts consistently on supporting business strategy. They find that managers are generally concerned about the lack of progress in integrating business development with IT capabilities. Relationship building needs to take place. The business needs to be engaged constructively in IS/IT issues. Specifically, relationship building involves developing users understanding of IT potential, helping users and IT specialists work together, and ensuring user ownership and satisfaction.

Joshi (1989) expresses strong emotions about power on social justice. Individuals or groups of individuals are expected to differ in terms of their power and influence. The powerful individuals can capture a lion's share of resources, which will result in uneven (i.e. unfair) distribution of resources. The findings of equity research and the analysis of power in social settings can be summarised as follows:

Power

→ ability to capture lion's share of resources

→ unfair distribution of resources

→ perception of inequity

→ dissatisfaction with the agents responsible for resource allocation.

Griffith and Northcraft (1996) state that users provided with information that is biased towards positive description and with no chance for costless discovery will have lower satisfaction with the technology than users provided with either more balanced information (positive and negative operational and descriptive information) or those allowed free training (costless pre-performance opportunities to discover the technology).

A study done by Brancheau *et al.* (1996) shows that the current trend has pushed the importance of technology infrastructure as the most critical success factor for implementing IS projects. However business relationships are still a major critical success factor. The only reason technology infrastructure is preferred, is the interference of the business influences.

Schrage (1997) expresses a different view when he says that Technology is not enough. People are the key to effective information creation and management. He also claims that once the importance of relationships is understood technology can be used differently. It should be as a surprise that 'people-ware' tensions and not hardware and software disputes will dominate design discussions that truly matter. If an organisation does decide to improve the way it shares information, it should focus first on changing the culture of sharing. IT departments should start investigating how individuals are rewarded and punished for sharing and withholding information. These matters are about behaviour, culture and politics.

The IS developer needs to acquire interpersonal relationship skills, skills in business practices. Skils in organisation work and thought processes have been acknowledged for some time. A specific application of these skills is required in the environment where concrete communication with the user is demanded as systems are developed with prototyping techniques (Ford (1993)).

2.5.9 Communication:

Ross (1977) has described a typical communication breakdown as follows: The systems developer asks the user what information he needs. The user, not accustomed to rigorous self-analysis, cannot express his information needs adequately. The systems developer then works out a project plan and gives it to the programmer. The systems developer converts what he thinks he heard from the user into flowcharts and

trappings of system design, altering the information needs in the process. The programmer implements the system after incorporating his own ideas and interpretations, further altering user needs. The final results frustrate the user and he becomes hostile or worse he sabotages the system.

Liedtka *et al.* (1997) identified traditional areas of weakness within companies, as the narrow specialists in systems development who see only their own solutions. They become self-centred egoists unwilling or unable to collaborate with colleagues. The outcome is fragmented perspectives and interest group politics that impede institutional change. It is clear that users and system developers must be open-minded and willing to be available for the project.

Reich and Benbasat (1996) report the establishment of linkage between business and information technology objectives as the key concern of system developers. The important social dimensions are that the system developers and the business users understand one another's objectives and plans. A study of measurement issues associated with the social dimension showed the following:

1. cross-references between written business and information technology plans
2. for mutual understanding between systems and business of each other's current objectives
3. congruence between long-term visions for information technology deployment of systems and business

Stephens (1995) recognises that users have begun to complain about having to deal with so many different people causing communication problems because of multiple layers of analysts between users and programmers. There should be specifically assigned system developers to interface with the users who should render exceptional customer service. System developers should be asked to consider specific users to whom they provide projects and then to estimate their level of satisfaction.

Ross (1977) also discerns a communication gap between users and the system developers. He mentions that the systems developer has little appreciation of the user's process. From a user point of view, the systems developer is trying to make the process too tough, not easy. The system developers build a mystique, 'a priesthood', their own 'mumbo-jumbo' ritual to keep users in ignorance. But it must be acknowledged that the users also play along. Their attitude is that the systems developer is the expert and must figure out the problems.

2.5.10 User led:

A project should be initiated by the user. Scott Morton (1991) supports this by structuring the start of projects as follows:

- Senior management should initiate the IT process.
- Functional management should become involved immediately after senior management.
- IT professionals should become involved when it is appropriate to begin technical discussions or when management education is needed.

Dodd and Carr (1994) maintain that a project team led by users negates the usual separation of programmers and users. The programmers learn by close contact with the user the required features and why the system, not the schedule, is important. It also provides insight into how individual work flow impacts on departments. Users and system developers become more attuned to a system's perspective of the total company. This leads to creation of organisational systems as opposed to functional systems.

Some facts need to be considered when the user management is involved in managing systems projects. Broadbent and Weill (1997) aver that a business-driven IT system involves decisions based on a sound understanding of where the firm is going rather than where it has been. This understanding starts with the firm's strategic context and its business and leads to the articulation of business and IT business vision.

2.5.11 Business management involvement:

There is a need for management to underwrite the project and this must be managed effectively. Jarvenpaa and Ives (1991) state that CEO support generally takes the form of involvement rather than active participation. Involvement is, however, an effective means of support. A high degree of such support does, in fact, correlate fairly well with IT progressiveness.

2.5.12 Right level of user:

It is fundamental to obtain the right level of user involved at the right time. A suggestion is to implement guidelines in order to achieve the right level of user involvement. Scott Morton (1991) provides the following guidelines for proper user involvement:

- users should become involved early enough to build a relationship of trust and to provide useful input to the systems design, but not so early that it appears that management does not know what it is doing. The last part of the statement is organisational dependent
- before users are involved, management should ask itself the following questions
  - are we ready to expand the group?
  - are we clear on project objectives?
  - do we have the right technological perspectives?
  - have we considered possible organisational impacts?

2.5.13 Life cycle:

Dodd and Carr (1994) believe that the methodology used to design systems should focus on the clear definition of user needs, with the idea of enhancing the users'

ability to perform a business function. IBM's Joint Application Design (JAD) is a step in that direction.

Byrd *et al.* (1992) mention that requirement analysis involves end users and systems analysts interacting in an effort to recognise and specify the data and information needed to develop an information system. It is well understood that the development of effective information systems requires thorough analyses of user information needs prior to IS design. This step in the process of systems development, generally referred to as requirement analysis, typically involves an analyst

1. working with end users to establish an understanding of organisational information processing needs
2. developing IS objectives
3. designing and developing IS alternatives
4. communicating the results of analysis to superiors, other analysts, and end-users; and
5. performing a system audit

Communication and the interpretation thereof is an obstacle in obtaining the requirement analysis and knowledge acquisition. Requirement analysis and knowledge acquisition is the most critical steps in their respective systems development processes.

Newman and Robey (1992) describe the development of an information system as a social process involving users and systems analysts, carried out in an organisational setting. System implementation outcome is not restricted to the technical validity of systems but also includes behavioural and organisational validity. Recommendations for user involvement, top management support, prototyping, end-user development, and so on, have been offered to improve the prospects of developing systems that are both technically and organisationally valid. These prescriptions are typically intended to supplement or replace standard structured methodologies by addressing the social relationships between users and systems analysts. They focus on the affective and behavioural responses of users, including the possible rejection of technically valid systems.

Responses indicate that a core of communication and group process skills is necessary for facilitators. The development of task-oriented and technical skills is likely to be separate process from that of the development of group dynamics skills. It is rare to find both in the same person. It is best to use facilitators who come from a technical background in order to acquire additional group process training. At the same time, "traditional" facilitators in organisations, such as from human resources, quality improvement, or JAD teams, must acquire some technical training (Niederman *et al.* (1996)).

Jarke (1986) states the end-users must be taught about the risks of computing and be given a general understanding of system design, development and software quality-assurance principles.

Davenport *et al.* (1996) maintain that frequently the simple step of putting people together to work in the same room greatly enhances knowledge work effectiveness. In system development processes significant gains have been achieved when IS professionals have worked side by side with users.

2.5.14 Evaluation:

Rubenstein (1989) reports that evaluation is a touchy subject. Everyone is in favour of it in principle, yet most people resist being evaluated. Too frequently and too intrusive an evaluation procedure can deter people and cause them to devote more energy and time to dealing with the evaluation than with the technical work. Too little evaluation short changes everyone and generates an attitude of indifference or neglect which can lead to sloppy planning, doing and implementation of technology projects.
The evaluation process should start from the initial screening of ideas and the acceptance of projects into the portfolio, through the 'doing' phase when projects are underway and require monitoring, to the after-the-fact phase when it is important to know to what degree a project was successful and what factors influenced the degree of success. Bear in mind these phases of evaluation are not all economic and not all quantitative.
A reason for evaluation is to improve communication between all concerned parties about project related issues. To identify both barriers to the project and off-track projects as well as to prepare downstream activities such as training, installation, etc.

2.5.15 Prototyping:

Ward *et al.* (1994) allege that prototyping is employed with no attempt to fully define systems before construction and user testing begin. It depends on fast iterative development, with assumptions being tested as development proceeds. These can relate to user's perceptions of business requirements.

If a user is left alone to develop a prototype, there are dangers that must be avoided, such as IS controls may be ignored (data integrity, adequate testing), operating costs of the finished system may be unacceptably high, etc. If on the other hand the team is allowed to become too big, other problems arise for instance trying to obtain consensus on requirements definition is one; or allowing too many requirements to be satisfied thereby expanding the scope too far.

2.5.16 Testing:

Basili and Caldiera (1995) state that re-use of knowledge, products and experience is a feasible solution to the problem of developing high-quality systems at a lower cost. Problems often arise when companies try to transfer the quality lessons learned in the manufacturing process to the software development process. User involvement is critical since software development happens once whereas in manufacturing process lessons are learned from massive repetitions of the same process. Software models

provide something less definite, that is the ability to learn from other software development projects. Software development can develop and implement plans for controlled, sustained and continuous improvement based on facts and data. This is necessary in the testing phase and with the involvement of the user.

Ford (1993) sees the test system as a critical success factor in the development of a new system.

Ford (1993) defines a test system as a mirror image of a live system. The test system is used to process data and then to compare the results with the expected results and the results produced by the live system.

2.5.17 Implementation:

According to Allingham and O'Connor (1992), Ginzberg (1978) the effective implementation of an information system is dependent on the user being responsible for delineating the project goals and objectives and evaluating the progress made by the system developers.

A study done by Griffith and Northcraft (1996) showed that less than 10% of system implementation failures appear to stem from technical problems. Most occurred because of human and organisational reasons, such as poor technology management including user misunderstanding of the meaning and/or uses of the technology.

Griffith and Northcraft (1996) emphasise that differences in cognition e.g. thoughts, perceptions, and constructed understandings, among users, designers and implementers are critical determinants of implementation success.

The time when to involve the users is not always easy to determine and might be difficult to implement. According to Scott Morton (1991) involving all eventual users is particularly difficult when implementation is to occur across multiple sites. The presence of a union that represents its members in the early stages of design and testing can mitigate this difficulty.

2.5.18 Training:

Gattiker *et al.* (1995) report that executives have acknowledged the importance of IS and the technology's contribution in the success gained by IS to help a firm's competitive advantage. Yet researchers have pointed out that the success rate of IS projects and subsequently, their most effective use could still be linked to limited training of end-users rather than to the technology itself. Also, the lack or low quality of user-friendly documentation of the information system or the software program used, as well as lack of user help offered by IS specialists to organisational employees and limited user involvement have been found to contribute to low effectiveness.

Joshi (1991) suggests altering actual inputs and outcomes for improving the equity impact of implementation. The objectives are to reduce user inputs and increase user outcomes. The following actions could reduce inputs:

- Well-designed training programs to reduce learning effort and frustrations.
- Help line/on-demand help.
- Extra temporary staff or overtime helps during implementation.

The following actions can increase outcomes:

- Positive equity through "royal/plush treatment" in training programs.
- Design reviews, or briefing sessions.
- Praise, recognition, award, salary/grade increase.
- Job reclassification.
- Alleviate concerns about loss of employment.
- Future prospects.

Perceptions of inputs and outcomes can be altered through suitable training, communication and fair procedures.

Griffith and Northcraft (1996) feel that users who are provided with information are biased toward positive description but if allowed free training will be more successful in their utilisation of the technology than users who are provided with more balanced information or who are not allowed a chance for 'costless' discovery.

Free training also has important implications for user satisfaction. Negative surprises will create user dissatisfaction with the technology. A second negative experience may be when their experiences do not confirm the expectations provided by implementers. If implementers provide enough free training, then users can only confirm their expectations. The more information users have during free training, the less likely they will learn to adapt in that period when mistakes are relatively costly. Therefore, a little failure is not only good but also necessary for successful learning and adaptation, as long as it can be made relatively costless (Griffith and Northcraft (1996)).

Jarke (1986) identified a major problem as the training of users in the new system. Training and user manuals should be minimised in print. Training should be in the form of consulting advice. Users in fact rarely refer to the manuals. An observation is that no matter how good the training methods are, a system will not be accepted unless its functionality can be demonstrated clearly.

Ford (1993) feels that productivity can be improved through the use of systems. One thing is certain, for the project to succeed there must be training. Training must be presented at a very basic level to cover how to operate computers as well as the use of the various applications. The training function is one of the most important factors which will ensure the success of the project.

Bjorn-Andersen *et al.* (1986) do not see training programs as the universal solution but feel that they still have a place in providing user support. Users need point of

need support, that is, help and advice on a particular issue at the time the user become aware that he/she needs help.

2.6 Summary

This chapter presented the review of all relevant and related literature on user involvement in the system development life cycle. The objective of this chapter was to establish an understanding of issues regarding the involvement of users in the SDLC and to gain insight into the complexity and issues concerned.

In the following chapter, the research methodology will be addressed. The chapter will describe the outline of the information gathered and used to conduct the research and the methods used to analyse it.

CHAPTER 3: RESEARCH METHODOLOGY

3.0 Introduction

This chapter aims to document the research process. It will highlight the research questions and the methodology. In so doing the chapter aims to justify the research methods adopted in terms of attaining the aims and objectives of the research.

The following diagram provides an overview of the research methodology used in this research.

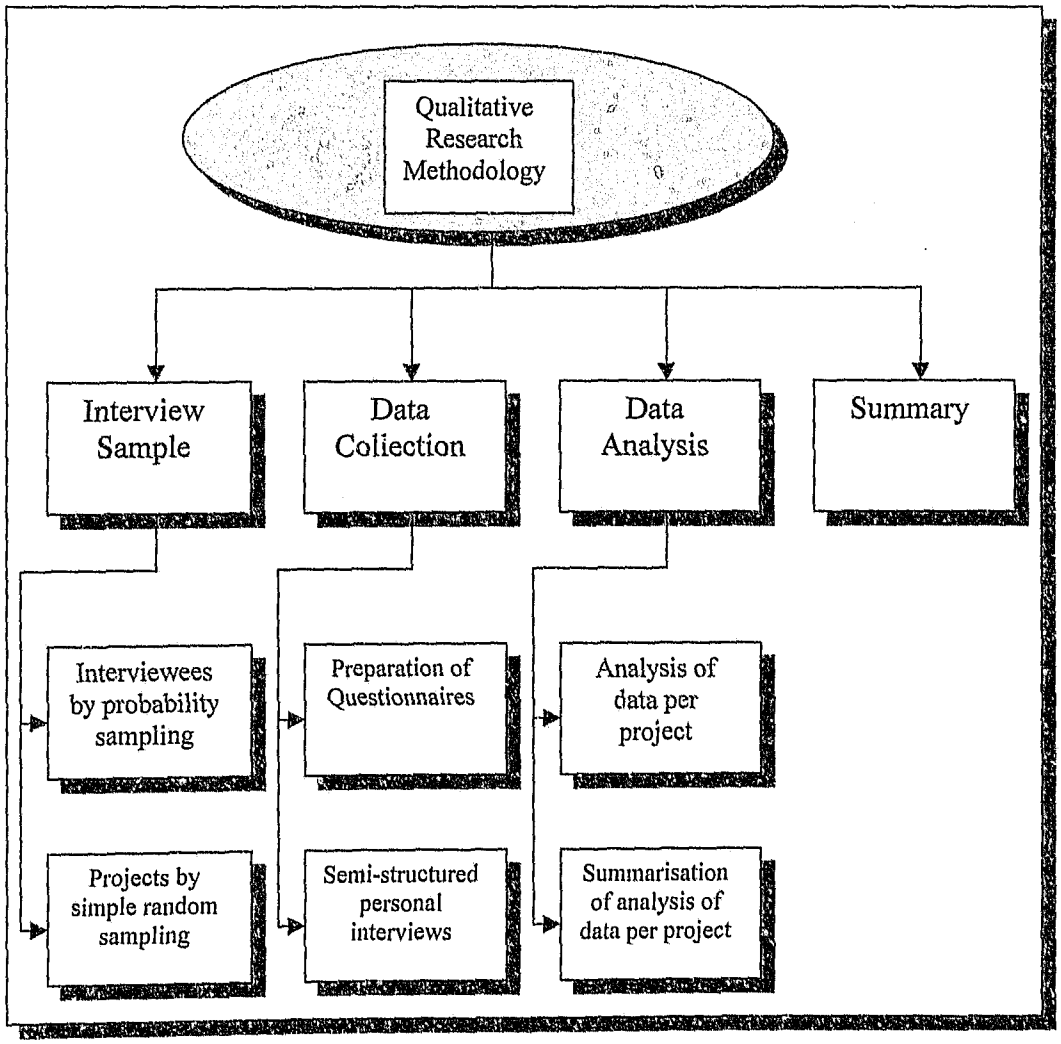


Figure 3: Roadmap through research

3.1 Aims and objectives

When justifying research methodology, it is useful to re-examine the aims and objectives of the research as well as the primary and secondary research questions. This research was aimed at to examining and analysing four different system development projects within a major bank in South Africa with the objective of determining different levels of user involvement and the effect this involvement had on the success or otherwise of the actual systems.

In the context of this research user involvement is defined:

> *"as the participation in the development by a member/members of a target user group"* (Tait and Vessey 1988).

In adopting this definition it is important to understand the use of the word "*participation*" As such, the research further focused on the role users play in the system development and implementation. Important issues were the user contributions and efforts.

Another aspect examined in the research was the expectations of the users and system developers because of the involvement of the users and specifically the expectation levels.

- Which expectations were met?
- Which expectations were not met?
- What was the cause of these discrepancies in expectation levels? .

In attaining these objectives the research aimed to provide evidence that even though a system is in use, it does not necessarily mean it is successful and also that user participation plays an important role.

The aim of this study was to examine and analyse whether different projects within different subsidiaries in a large bank in South Africa delivered successful or unsuccessful systems with the involvement of users in the systems life cycle.

The study further focused on the role users' play in the systems development and implementation. Important issues were user contributions and efforts. Another consideration was the expectation of the users and system developers because of the involvement of the users.

- Which expectations were met?
- Which expectations were not met?
- Why where these expectations not met?

In attaining these aims and objectives the following questions were posed.

Main research question:

What impact does user involvement have on the development of systems within a major bank in South Africa?

In addressing this question the following sub-questions had to be answered.

Sub-questions:

1. What role do users play in systems development and implementation?
2. What benefits were expected from user involvement?
3. Which of these benefits were in fact achieved?
4. What anticipated benefits were not achieved by user involvement and what were possible reasons for this?

3.2 Justification of a qualitative research methodology

It is important to examine the methodology. An understanding of what is meant by methodology is necessary. A method is a way of accomplishing an end result. The - *'ology'* means *'the study of'*. Therefore, methodology is considered the study of a method or methods to reach a desired end (Leedy 1993).

A qualitative, verbal data gathering, research methodology was used. User involvement and participation involve the behaviour of people and much of the data to be obtained related to human ideas and could be termed as qualitative, as opposed to quantitative facts and figures. No instrument should be used without questioning the procedures used to develop it as well as the appropriateness of the measure (Etezadi-Amoli and Farhoomand 1991). Perceptions and opinions were major aspects of the answers obtained. The qualitative method is considered a *'warm'* approach since, in great part, it is concerned with human beings, interpersonal relationships, personal values, meanings, beliefs, thoughts, and feelings (Leedy 1993).
A qualitative approach to research is more suitable for the Information Systems (IS) discipline since it enables the researcher to capture a more holistic view of the problem. Also it is more concerned with *words* as opposed to *numbers*. The qualitative, verbal data gathering, research methodology, i.e. that of semi-structured interviews, used in this research, is supported by Leedy (1993) when he says that verbal data, by its very nature, is qualitative. Semi-structured interviews formed part of the data gathering strategy. Such interviews are viewed by Easterby-Smith *et al.* (1991) as one of the most fundamental qualitative research techniques.

Some features of qualitative studies according to Eisner (1991) are outlined below:

- Qualitative studies tend to be field-focused. Observations are made after the researcher has visited the research sample.
- Qualitative research uses as instrument the self. The presence area is perceived and its significance is interpreted, rather than checking the behaviour.

- Qualitative studies present in text format the use of language and voiced comments.

The task of the qualitative researcher is one of analysis and synthesis. The qualitative researcher attempts to describe, decode, translate come to terms with the meaning of more or less naturally occurring phenomena (Easterby-Smith *et al.* 1991). The data transcribed must be analysed and then the researcher must interpret and collate the information to form a meaningful matrix (Leedy 1993).

Interviews are used to understand and explore the meanings interviewees attach to questions, issues and situations. Interviews can be seen as an appropriate research method when the following apply:

- When an aim of the interview is to develop an understanding of the interviewee's "world".
- When it is necessary to understand the constructs that the interviewee uses as a basis for his/her opinions and beliefs about a particular matter or situation (Easterby-Smith *et al.* (1991).

Both of the above two points hold true in the instance of this research. In order to gain a holistic and explicit understanding of the underlying issues which affects systems development success in respect to user involvement it is essential that an understanding be ascertained of the interviewee's world. It is also essential that an understanding of the constructs that the interviewee uses as basis for his/her opinions and beliefs about a matter or situation can be determined.

Based on the above information, the research questions answers, and their interpretation fall into the category of qualitative research. The best method to determine the success or otherwise of user involvement in systems development life cycle would be a qualitative research approach. Taking into consideration that a large cross-section that was interviewed and the qualitative method used the results of this research can be seen as accurate.

3.3 Interview sample

For the purpose of this research twenty-four staff members, from various departments within different subsidiaries of a large bank, were selected.

A probability sampling was made to select the interviewees. Interviewees spanned the entire spectrum of users from senior executives (sponsors and project managers) to the clerks (end-users and programmers). Care was taken to identify interviewees who had different roles and responsibilities on the project. Within each project three system developers and three users were selected and interviewed. The three system developers comprised the systems project manager, an analyst designer and a programmer. The users consisted of the business sponsor for the project as well as a senior business analyst/user and an end-user. The researcher had to obtain valuable insight into the whole process (Easterby-Smith *et al.* 1991). This was achieved by choosing staff who had been involved throughout the life cycle of the projects. All interviews within a project were conducted after at least three months from the live

date of the system. Choosing them via simple random sampling included four different projects, each from another department.

3.4 Method of selecting the interviewees involved:

All the interviewees were at least still involved in the project in one way or another. The following provides a description of why each of the interviewees was selected.

- *The system project manager*: This was the longest acting manager. In all cases the manager had been involved in the whole life cycle of the project. Since the system project manager was in charge of all the systems development and system developers, it was important to include him/her for a holistic picture of the systems development involvement.
- *The analyst designer:* He/she was the chief and designer and is still involved. He/she was included with permission of the system project manager. He/she was also included for his/her knowledge of the layout and design of the system.
- *The programmer:* A programmer who is still involved in the maintenance and included with the permission of the system project manager. He/she was involved as the interpreter and presenter of the information presented by the users.
- *The business sponsor:* This was the longest acting sponsor. In all cases the sponsors had been involved in the whole lifecycle of the project. He/she was included as the sponsor and for having a major stake in the success of the system.
- *The senior business analyst/user:* A senior business analyst/user who is still involved and working with the system. He/she was identified by the business sponsor. He/she was included for his/her major business knowledge and understanding of what was expected of the system in the long run.
- *The end-user:* An end-user who is still involved and working with the system. He/she was identified by the senior business analyst/user. He/she was included as the hands-on expert in the end and for having to make the system work for the business.

3.5 Method of selecting the four projects.

In the process of selecting the types of projects to include, certain characteristics were identified to help selecting a proper spread of projects.

Each of the four projects selected had the following characteristics:

1. After many system failures and research, the bank had established a policy that users should be involved in the development life cycle of a bank system.
2. None of the chosen systems was older than one year, i.e. since the live date of the implementation of the system. This allows for no discrepancies to the fact that the user-involvement policy of the bank at least been known to the project team.

3. All projects had been developed by a group of more than ten and less than twenty-five people.
4. Each project has at least three interfaces to other existing systems on different platforms.
5. The results of each project were used by the general public interfacing with the systems via some platform or via a bank branch system. The presentation of the combined effort alone is done since the projects where representative of similar infrastructure and complexity.

3.5.1 Description of the four projects involved:

Because of having to protect the information of the projects to ensure the competitive advantage of the bank involved, only generic names and descriptions will be provided. However it is hoped that enough will be revealed to enable a fundamental understanding of each of the projects. .

3.5.1.1 Project 1: Smartcard project:

This system was developed from scratch but had to interface with the credit card system, Automatic Teller Machine (ATM) system, branch terminal system and the accounting system. Its general purpose is to create a smartcard chip on the credit card and the general bank card for use at any ATM, branch or at retail stores for deposits, withdrawals or payments.

Some general information about the Smartcard project can be summarised as follows:

Over budget/Under budget	Number of people involved in development of system	Time taken for development of system
Under budget	23 people	18 months

Table 1 – Smartcard project information

3.5.1.2 Project 2: Debit card project:

This system was developed from scratch but had to interface with the Automatic Teller Machine (ATM) system, branch terminal system and the accounting system. Its general purpose was to change the general bank card to be a debit card as well for use at any ATM, branch or retail stores for deposits, withdrawals or payments without going into credit.

Some general information about the debit card project can be summarised as follows:

Over budget/Under budget	Number people involved in development of system	Time taken for development of system
Under budget	19 people	13 months

Table 2 – Debit card project information

3.5.1.3 Project 3: Debit/retail card project:

This system was developed from scratch but had to interface to the Automatic Teller Machine (ATM) system, branch terminal system and the accounting system and the retailers system. Its' general purpose is to provide a specific debit card for use at a specific retail outlet, but debit card based.

Some general information concerning the Debit/Retail card project can be summarised as follows:

Over budget/Under budget	Number of people involved in development of system	Time taken for development of system
Under budget	15 people	10 months

Table 3 – Debit/Retail card project information

3.5.1.4 Project 4: Electronic banking - new functions - project:

This system was to enhance the current system with new functionality and had to interface with the credit card system, branch terminal system, user interface platform and the accounting system. Its general purpose is to provide additional functionality to the home bankers functionality in electronic format.

Some general information about the electronic banking - new functions - project can be summarised as follows:

Over budget/Under budget	Number of people involved in development of system	Time taken for development of system
Under budget	15 people	9 months

Table 4 – Electronic banking – new functions – project information

3.6 Data collection strategy

Because of the nature of the respondents, i.e. of being involved from the user side as opposed to being involved from the system development side, two types of interview schedules were developed. Personal interviews were conducted with all twenty-four selected staff members, in a semi-structured way in order to obtain the answers to the pre-defined questions. The pre-defined questions were discussed, pilot tested and then verbally presented to the interviewees from the typed questionnaire. The answers were recorded on tape. During the interview, any unclear answers were queried and clarified. The taped interviews were later transcribed for ease of analysis. An example of a transcribed interview is presented in appendix C. The questionnaires are presented in the appendices (appendices A (1) and A (2)) of this report. Appendix A (1) is the user questionnaire and Appendix A (2) is the system developer questionnaire.

The questionnaire was subdivided as follows:

Question Numbers	Aim of questions
1 and 2	To obtain an understanding of the interviewees' general feeling about a successful system.
3 to 8	To gain a feeling of the type of people, the users and system developers, feel should be part of a project and the reasons for this. They include the amount of involvement of the involved people.
9 to 24	Concentrate on the breakdown and specific parts of the project. They include the phases and results and participation within these phases. (project lifecycle)
25 to 34	Concentrate on feelings and general comments about system development projects and their results.

Table 5 – Questionnaire breakdown

The various interviews were scrutinised and the results finalised. By comparing the various respondents' answers, some understanding of the research questions was obtained.

3.7 Data analysis strategy

Evidence was gathered via semi-structured interviews. The interview data was analysed using interpretative analysis. Interpretative analysis involves describing the facts, examining the cause and effect perceived by the interviewees, identifying trends and drawing conclusions from the data. Creativity, reflection and intuition were applied in studying the data in order to draw a conclusion. The results of the interviews were analysed for each project individually and then combined and

analysed as a whole. Only a combined analysis and not individual project results are presented in this research. Presentation of the combined effort was done as the projects were representative of similar infrastructure and complexity. By having the various types of users and system developers involved, background and experience levels could also be observed.

The results of the interviews can be viewed as data. However data is of no value merely as data. Therefore, the data was interpreted and investigated to examine the relationships between certain factors that played a role in each question and its answers.

3.8 Summary

This chapter discussed the research methodology in order to achieve the research aims and objectives. A justification for the research methodology was also given. This research was based on a qualitative and interpretative method. The validity of this approach was based on providing interpretative knowledge of the subject under discussion.

In the next chapter the evidence and the analysis of the evidence will be expounded. Appendix B (1) represents the summary results for the users interview questionnaires. Appendix B (2) represents the summary results for the system developer interview questionnaires.

CHAPTER 4: PRESENTATION AND ANALYSIS OF EVIDENCE

4.0 Introduction

In this chapter the summarised results and analysis for all projects and individual interviewees are discussed. A total of twenty-four interviews were conducted in one-on-one interviews with each of the twenty-four interviewees. These interviews involved four projects with three systems people and three users per project. The three system developers consisted of the systems project manager, an analyst designer and a programmer. The users comprised the business sponsor for the project as well as a senior business analyst/user and an end-user.

The following diagram illustrates this breakdown.

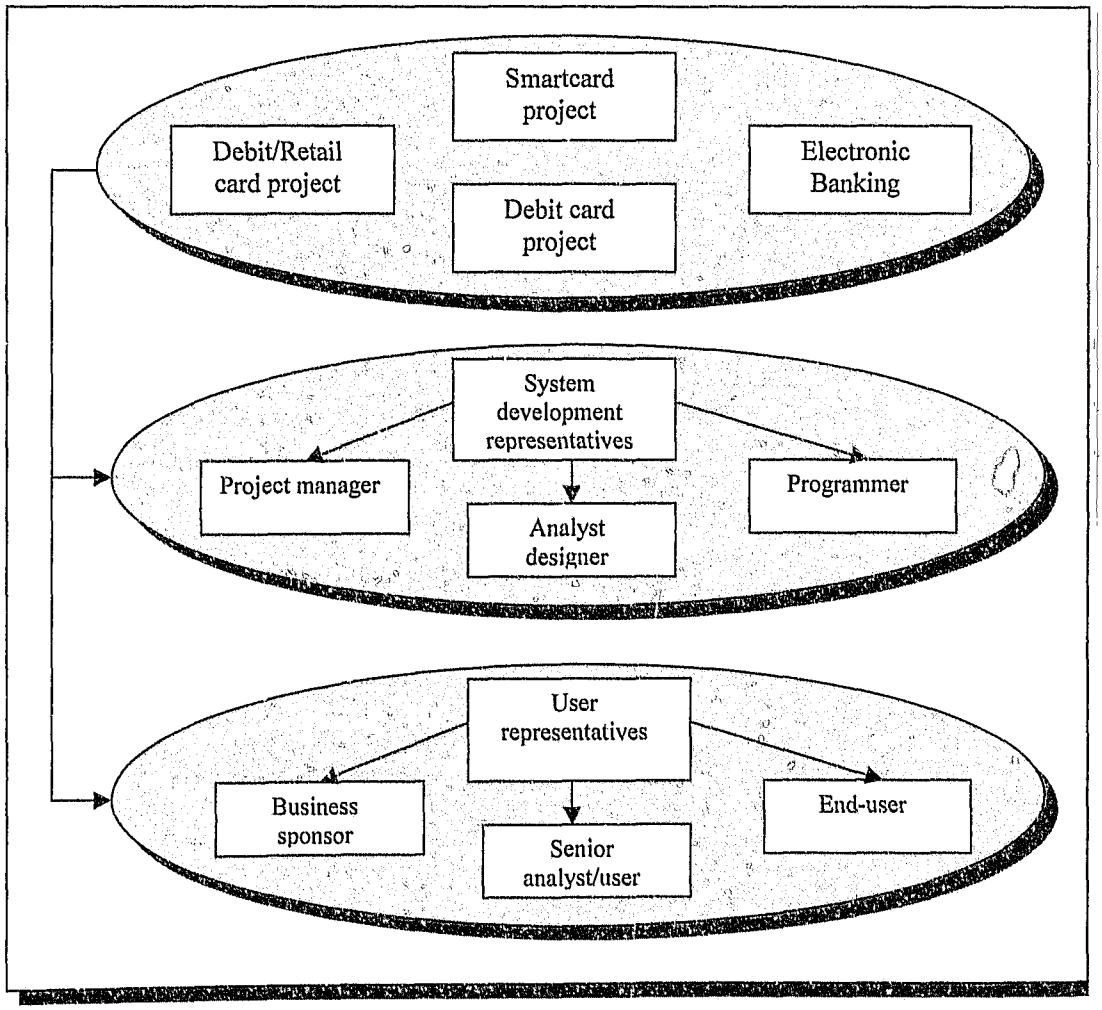


Figure 4: Data source breakdown

The following appendices detail the actual analysis for each of the questions. Appendix B (1) contains the summary results for the users interview questionnaires. Appendix B (2) contains the summary results for the system developer interview questionnaires. These appendices list the number of responses, the percentages they represent as well as a brief description of the answers to the relevant questions. The data in these appendices was analysed using interpretative analysis. Interpretative analysis involves describing the facts, examining the cause and effect perceived by the interviewees, identifying trends and drawing conclusions from the data. The data was also studied and analysed by applying creativity, reflection and intuition.

4.1 Definition of a successful system

This section relates to questions 1 and 2 and considers all the answers to the questions on how the interviewees felt about the definition of a successful system. The first question was as follows:

4.1.1 Users and system developers: (the sequence in order of importance is from most important to not so important.)

- A successful system must cover all the users needs and the system must be what the users want. Some of the system developers did express some concern about this point. They felt that the users almost never use the system to its full potential or its full purpose.
- A successful system must be user-friendly.
- A successful system must be very reliable.
- A successful system must be easy to use. Almost anyone must be able to use it.
- A successful system must have very good response time. In most cases the users will have a client waiting for an answer and delays would look bad.
- A successful system must be available 100% during the business hours which the system supports. This excludes maintenance times if such was specified in advance.
- A successful system must be easy to learn but not necessarily 'spoon-fed' easy.
- A successful system must have very few problems after implementation and then these problems must be phased out quickly. The system developers being interviewed mainly supported this comment, although also supported by some of the users.
- A successful system must be able to recover costs relatively quickly. Four end-users and the four programmers being interviewed did not support this feeling. The reason for this point of view was that they were not sure about cost recovery, since they were not involved at the level of decisions involving cost and cost recovery.
- A successful system must be adaptable although not much emphasis had been put on this. A systems project manager felt that adaptability must fall within certain time frames.
- A successful system must be supported by a Service Level Agreement (SLA). Only ten of the interviewees felt that this was an important issue. Some of the

system developers felt that some measurement was necessary, even if not in the form of a SLA. Although the system must only be measured in general not exactly.

From the above definitions given, one could define a successful system as:

"A system that satisfies a users needs and requirements and which are user-friendly and reliable. It must also be easy to use and produce output as specified by the users."

This is supported by the literature discussed in chapter 2 under the section "Definition of a successful system". According to Stephens (1995) one of the systems areas' first priority goals should be to consider achieving customer satisfaction. This statement supports almost all of the above definition points.

With reference to question two the view of twelve interviewees (50%) was that the systems were unsuccessful. Four (16%) felt that the system was successful. Eight (34%) felt that it was both successful and unsuccessful. The reason for the last opinion was that at least there was a system in place although not all functionality was represented or it was not working properly, i.e. something was better than nothing, even if that something was not perfect.

A major responsibility could be attributed to the system developers. They must be more aware of the user needs and discern the user thinking and understanding in order produce a successful system. According to Joshi (1991) the following factors are considered as relevant by researchers in determining user acceptance and assessment of a system.

- Ease of use of the system.
- Usefulness of the system.
- Prior user expectations of the system.
- User involvement in development of the system.
- The impact on the work environment after system implementation.

While there are various perspectives on resistance to change, there is consensus that understanding and explaining resistance to change is important. These explanations, even if informal or implicit, guide the behaviour of the system developers. Researchers recognise that better theories or models of user resistance will lead to better implementation strategies and a desired implementation outcome.

The users also have some responsibility for the implementation of a successful system. The users must be adaptable and make proper use of the system as delivered. According to Gattiker (1992) if a company is to reap the benefits of its huge financial investment, the workforce must possess the skills necessary to make efficient use of the new computer-based technology. To achieve this it is very important to assess how well end-users make use of new technology.

Wildman (1994) also supports this definition for a successful system. He feels that the most crucial usability issues for any user interface is the ability of users to find the functions they want to perform. This statement affirms the ease of learning and ease of use which follow when users can predict where in a menu structure, functions can be found. He feels that one key to designing and evaluating software usability is to know what users are thinking.

The point of cost recovery must be considered carefully. There are various options on how to achieve proper cost recovery. Montaniz and Kissel (1996) support the concept of cost recovery and have some suggestions on how to optimise it. According to them one way to cost recovery is by optimising error messages. When error messages are optimised, users are more likely to recover efficiently and continue with the task at hand. For the users, the benefits of well-designed error messages are better productivity and more satisfaction with the product. The benefit to the systems designers is that users who recover on their own have no need to call the help line and tap into valuable time.

4.2 Who to involve and to what extent

4.2.1 Users and system developers:

This subsection discusses questions 3 to 8. The initiation of projects, in all instances was from the business area. One of the end-users claimed that the project was initiated by the systems area but this view was not supported by the other five project staff interviewed and therefore is not regarded as representative. All twenty-four interviewees (100%) felt that the business area should initiate a project. Six interviewees (25%) actually expressed the view that the systems areas can prompt about the need for enhancement or new systems but the end result is still for the business area to decide and initiate. These six also maintained that infrastructure change would definitely be initiated from systems area but that the business area needed to pay for changes and therefore had to be taken into consideration and convinced with proper motivation.

The supervision of projects had a different flavour. In general, the users and the system developers felt that the supervision should be, at least in some respect, a joint responsibility. The business area's involvement is supported by the rationale that they are, in the end, the users of the systems and therefore need to be satisfied with the outcome. The system developers should be involved, as they need to implement the system.

Two contradictory schools of thought emerged. The first is that the business area and the systems area should share the responsibility for supervision of projects. Systems area should concentrate more on the organisation of the project and the business area should dictate their requirements and ensure they are implemented. It must be borne in mind that the business area and the systems area are in fact in two different camps and what the one says is not necessarily what the other one hears. It is imperative for both to be involved in the supervision and to state clearly the checks to ensure the understanding is the same.

The second is that initially the business area must supervise the project. Hand-over should be done in the analysis phase to the systems area but there must be liaison with the business area.

A concern raised during the analysis of the questionnaire answers was when it became apparent that there was no consensus about who really supervised the projects. Within each project there were discrepancies between the interviewees about who supervised the project. This is a definite area for clear understanding in the future, as it is definitely a problem. It could be surmised that this lack of agreement could have possibly lead to unsuccessful systems.

Involvement of the right level of user was seen as follows:
Eight (33%) users and system developers felt that the project included the right level of users. Five (21%) users felt that, for the project, only half of the users involved were the right level of users, the other half of the users were not the right level of users. Four (16%) users felt that initially the wrong level of user were involved but they were replaced by right level of users later in the project. Seven (29%) system developers felt that the wrong level of user was involved. One (4%) systems developer felt that too many users were involved which created too much unnecessary extra work.

The following supports the reasons for the feeling that the wrong level of users were involved.
Three users (12%) felt that too few qualified users were involved. Three users (12%) felt that the end-users had to be involved earlier in the project. Two users (8%) felt that managerial users were too involved and should only be involved in specific areas. Their involvement also made lower end users keep quiet for fear of saying the wrong things in their presence. This created problems since lower end users have very valuable input. One systems developer (4%) felt that more senior users who know the policies of the organisation should be involved. Two system developers (8%) felt that they should have the ability to choose the users to be involved. Three system developers (12%) felt that more end-users that know the products should be involved. Three system developers (12%) felt that they had to involve more committed users. The general feeling was that users should not be involved too late in the project. End-users should be more involved in the early phases even if only to hear what is discussed so that misunderstanding later on is reduced.

A strong feeling was apparent in the above. The users and the system developers definitely had different feelings about the involvement of the users as well as to who should be involved.

The supervision of a project can rarely be left to the systems area alone. A combined effort is necessary to make a system successful. Reasons for this is supported by Frenzel (1992) when he mentions that systems managers have surprising little contact with users. A study was unable to determine systems managers' effectiveness. His reasoning is that systems managers have been trained in technology, but lack the general management skills demanded by their organisation. Their jobs should demand knowledge of people management and organisational considerations rather than only programming or hardware expertise. Controlling and protecting business

assets are a fundamental responsibility of any manager. This is the area in which user managers are trained and, because of its importance, both systems and business managers should be involved in the effort to implement a successful system.

4.3 The project life cycle

This subsection discusses questions 9 to 24. These questions were aimed at illustrating the breakdown and specific parts of the projects including the phases, results and participation within these phases.

4.3.1 Users:

All users felt that a phased approach had been followed which corresponded to banks' policy about following a project life cycle in systems development.

The matter of checks being in place had different responses. Half of the users (50%) felt that checks were in place and four users (25%) believed that in the course of the project the checks were eventually implemented. The rest (25%) felt that the checks were either inefficient or non-existent. This emphasised the need for communication and the requirement for the sign-off of deliverables and milestones.

Four users (25%) felt that the phased approach helped to put a structure in place for the whole life cycle and development of the system. Four users (25%) believed that the project could be successful more quickly this way. They also felt that by working in phases, there was the ability to establish needs and change ideas as the process continued which eliminated problem areas sufficiently. Four users (25%) felt that it could be very sufficient but only if done properly.

The users were involved in the life cycle as follows:

- 9 users (75%) in the requirements phase
- 6 users (50%) in the feasibility study
- 11 users (92%) in the systems analysis phase
- 4 users (33%) in the setting up of documentation
- 8 users (67%) in testing
- 1 user (8%) only in last part of testing
- 2 users (17%) in design and construction
- 2 users (17%) in the post-audit

The users' feelings about being involved in the development life cycle varied as follows:

- 1 user (8%) felt that it was not adequately addressed, but if adequately addressed it could have been great for the end result
- users (25%) felt that it was great to have been involved
- users (34%) felt that it was great to have been able to have say in what the users needed and not only to have been given something that had to be made to work
- users (25%) felt that life cycle involvement was a good idea because no one could force a user to use a system but by involving them the users become more committed
- 1 user (8%) enjoyed the experience by being involved

The users' feelings about whether it helped being involved in the development lifecycle and the results thereof can be described as follows: 1 user (8%) felt that involvement in this project was not helpful at all. 9 users (75%) felt that they were able to give input. 8 users (67%) felt that they were able to verify if the interpretation of the system developers was correct. 6 users (50%) were happy that they were able to check the end results. 1 user (8%) only felt helpful at beginning of the project.

The goals the users had to help achieve were summarised as follows:

- 8 users (67%) had a goal at the business perception phase.
- 12 users (100%) were involved in JAD participation.
- 6 users (50%) had a goal in the documentation phase.
- 0% were able to achieve a goal in setting of standards.
- 8 users (67%) were involved in the testing phase.
- 0% during prototyping.
- 11 users (92%) in screen/report/form design goals.

The response about whether they had met the goals has the following results:

- 3 users (25%) felt they had met the goals
- 2 users (17%) felt they had achieved the goals but not without difficulty
- 4 users (33%) felt they had met some goals but also not all
- 3 users (25%) felt they had not met the goals because their involvement was not adequate

Involvement when testing was perceived to be adequate. 8 users (67%) were involved in unit acceptance testing (UAT). These were all the end-users and the business analysts. The non-involvement of the sponsors can be deemed as natural since their focus was more on the strategic side of the project. 5 users (42%) were involved in program testing. 4 users (33%) were not involved at all. As previously mentioned these were the 4 sponsors.

The involvement in testing was seen as follows: 2 users (17%) felt that they were involved too late to be of major help but that they did help. 5 users (42%) felt that their involvement was helpful. 1 user (8%) felt that only some of the testing helped but not the rest.

The determining of test data was seen as follows:

- 3 users (25%) felt it was done by system developers
- 2 users (17%) felt it was done by the users
- 3 users (25%) felt it was done jointly by the system developers and users
- 4 users (33%) did not know who determined the test data. The latter 4 were the sponsors who had no real concern about who determined the test data. Their concern lay in getting the job done and not how it was done.

Training of the system was seen as follows:

- 2 users (17%) felt the system developers should do the training

- 3 users (25%) felt it should be done by the users
- 2 users (17%) felt the training should be done by system developers in conjunction with involvement from users
- 1 user (8 %) felt it should be done jointly by system developers and users
- 4 users (33%) did not know who did the training

Users feeling about writing of the training manuals was:

- 3 users (25%) felt that the training manuals was written by system developers
- 3 users (25%) felt it had been done by users
- 3 users (25%) felt no training manuals existed
- 3 users (25%) did not know who wrote the training manuals. Lack of consistency during the analysis of these answers emphasis the need for addressing this very important aspect.

By whom the operations manuals were written:

- 8 users (67%) felt they had been written by the system developers
- 1 user (8%) felt they had been written by system developers and users
- 3 users (25%) did not know who wrote the operations manuals. The latter three where the sponsor and of no real concern.

1 user (8%) did not know whether the manuals were adequate and covered everything, 4 users (33%) felt that they were adequate and covered everything, 1 user (8%) felt that hopefully it was adequate and covered everything, 2 users (18%) did not know because they had not seen them yet. The latter were sponsors who saw no need to check the manuals. 3 users (25%) felt that they were not adequate and did not cover everything. 1 user (8%) felt that they only used the training manuals and would not know.

4.3.2 System developers:

11 system developers (92%) said they had followed a phased approach that corresponded with the banks' policy about following a project life cycle in the system development phase. 1 systems developer (8%) did not think they followed a phased approach. No apparent reason could be derived for his lack of knowledge. The assumption was made that as a programmer he was new to the bank and lacked knowledge of the banks' policies.

1 systems developer felt that no checks were officially implemented after each phase. 2 system developers (17%) did not think that checks were implemented after each phase, 1 systems developer (8%) thought that checks were implemented but were not used. 8 system developers (67%) felt that there were checks implemented place after each phase.

1 systems developer (8%) expressed the opinion that they should be close to the sponsor of the project and provide regular feedback to management and receive regular feedback from the team in order to make the phased approach successful. 2 system developers (17%) had never encountered the phased approach work. 2 system

developers (17%) felt that the phased approach gave structure to the project. 5 system developers (41%) felt that they could stop the project early if there was insufficient acceptance by users. 2 system developers (17%) felt the business area and systems area could learn to communicate via the phased approach.

The system developers' opinion, about which part of life cycle the users were involved in, were as follows:

- 8 users (67%) were involved in the requirements phase,
- 6 users (50%) were involved in the feasibility study,
- 11 users (92%) were involved in the systems analysis,
- None were involved in prototyping,
- 2 users (17%) were involved when setting up of documentation,
- 9 users (75%) where involved in the testing cycle,
- None were involved at the design and construction phase,
- 2 users (17%) were involved in the post audit phase.

The opinions of the system developers about involving users in the development life cycle were as follows:

- 2 system developers (17%) felt that it depended on the project with their specific project they needed to give input only but not became too involved,
- 1 systems developer (8%) enjoyed the users involvement very much,
- 3 system developers (25%) felt that it helped solve problems continuously,
- 1 systems developer (8%) felt that involving users too early in the project merely extended projects,
- 2 system developers (17%) felt strongly that involving users were an essential component.
- 3 system developers (25%) felt that users had to be involved to achieve what the system required.

1 systems developer (8%) felt that it did not help involving the users since the project was wrong from the start, 8 system developers (67%) felt that they were more able to give input, 6 system developers (50%) felt they were more able to verify correctness of interpretation, 5 system developers (42%) felt they were able to check end results, 1 systems developer (8%) felt that they had lost too much time involving the users.

The goals that the users had to help achieve were summarised as follows:

- 7 system developers (58%) felt these goals were achieved in business perception phase,
- 12 system developers (100%) felt these goals were achieved in JAD participation phase,
- 5 system developers (42%) felt these goals were achieved in documentation phase,
- None were achieved at setting of standards,
- 8 system developers (67%) felt these goals were achieved in testing phase,
- None were achieved in prototyping,
- 11 system developers (92%) felt these goals were achieved at screen, report and form design.

6 system developers (50%) felt that the users had met the goals. 1 systems developer (8%) felt that the users had met some of the goals. 1 systems developer (8%) felt that goals had not been met adequately, and that the system developers had to think about those left out. 3 system developers (26%) felt that the users had not met the goals. 1 systems developer (8%) felt that there had been problems but in the end everything had been resolved.

In the testing phase the following opinions were expressed:
8 system developers (67%) felt that the users were involved in the UAT.
5 system developers (42%) felt the users were involved in program testing. These views are consistent with the users' views of their involvement in the test phase.

1 systems developer (8%) felt that it helped partially to involve the users in testing. 8 system developers (67%) felt that it definitely helped to involve the users in testing and 3 system developers (25%) felt that it had not helped at all to involve the users in testing.

5 system developers (42%) felt that the users determined the test data. 4 system developers (33%) felt that the system developers determined the test data and 3 system developers (25%) felt that the user and system developers jointly determined the test data.

3 system developers (25%) felt that the system developers and users jointly did the training, 3 system developers (25%) felt that the users did the training, 3 system developers (25%) felt that the system developers did the training, and 3 systems developer (25%) did not know who did the training. The inconsistency during these questions and answers are a reason for concern. No real value was attained from these answers.

3 system developers (25%) did not know who had written the training manuals, 4 system developers (33%) said the system developers had written the training manuals, 3 system developers (25%) said that no training manuals existed, 2 system developers (16%) said that the users had written the training manuals. Here was another reason for concern as no consistency was found among the project members.

9 system developers (75%) felt that the system developers had written the operations manuals, 3 system developers (25%) did not know who had written the operations manuals. The latter three where all programmers who had not been included in any feedback regarding this part of the project.

Whether the operations manuals were sufficient and covered everything:

- 4 system developers (33%) felt they were sufficient and covered everything
- system developers (17%) felt they were not sufficient and did not cover everything
- 5 system developers (42%) did not know whether they were sufficient and covered everything
- 1 systems developer (8%) felt that the project had failed so they were not sufficient and covered everything.

4.4 General comments and opinions

This sub-section discusses questions 25 to 34.

4.4.1 Users:

A general opinion expressed by the users on all the projects was that the systems were not regarded as successful since the system developers kept changing. Some changes were system developers leaving and new system developers taking their place. Other changes were from one level of system developers to another level of system developers. Every other month a new systems developer would come and ask the same questions. Too many changes in system developers meant learning from scratch each time. In other words no transference of knowledge took place. Users did not have time to do this and it proved to be very annoying. User time was also very limited since the user had to cope with the normal workload as well as repeated problems with the old systems. These old systems were designed without the user involvement and were therefore not satisfactory. This resulted in continuous changes having to be made which took up a large portion of the normal days working hours. This did not leave the user with enough time for additional problems.

The above mentioned problems have been acknowledged in the literature by Stephens (1995) as quoted in the literature review.

In general the projects could have been very successful but a few issues inhibited the feeling that it was a great success in the end. The users were very excited about the system but when they had to sit down and do the work, they back-pedalled. They did not want to sit with the system and the cycle took too long. The system developers also kept returning to ask the same questions. Eventually the users started to think that the process would not going to work so they stopped worrying about it. The system developers did not come back with feedback and the users started to become frustrated, wondering why they actually gave any input because nothing happened anyway.

Despite the limited time, the project was extended to obtain the users input, but this meant more man-months which in turn meant new changes to the business had to be made in the meantime which had not been catered for in the beginning. Also the new system, despite user involvement, seemed to be very difficult and time consuming. The users were not even sure how to use the system properly.

Business and system developers repeatedly stated that the business had to drive as if it were said enough, someone might believe it. The policies within the organisation about academic, practical, textbooks and quality assurance (QA) were definitely not in agreement.

The system developers displayed a positive attitude about including the users in the development of the system. Previous experience had been an attempt to implement new system without user involvement. The feeling was not that those systems without user involvement were not successful or not fully functional. The involvement in the development of the system not only gave a better view of the system, but also gave the opportunity to say how they wanted the system to work, for the department and for the other users of the system.

Users should have been involved earlier. System developers should ask how users viewed it, what they thought and how it would work. They could still make decision but they had to refer to the ranks. Users wanted systems that worked. It was not acceptable to pay for systems that did not work and which had to be fixed. The problem occurred that the users had to pay for the system to be fixed.

The users had to rely on what system developers told them. If the system developers said something could be done, the user knew it can. If the systems developer said it could not be done, the user did not necessarily know if that were true. Another problem was that if the systems developer said an addition or change would take fifty hours, it might actually only take five hours. The users do not know what to believe, as there had been too many discrepancies in the past. Sometimes these over quotes caused the user to reject a change although it was essential and the best for the business. System developers had to understand that what was important for them were not necessarily important for the business. Also what was not important for the user might very well be very important for the business.

The success of a project can depend on system developers and how willing they are to help users. Their attitude and their understanding are also vital. The users do not know how systems work internally. Another problem is that users encounter problems and relay them to the system developers. The system developers often respond by saying that the problems are not problems and nothing will happen. If the users prove the problems do exist, the system developers will merely claim that the problems are not on their side and that would be the end of he matter. The feeling is that too much incorrect information has been conveyed by the system developers and users merely have to accept it. The users feel that they also need to know about programming so that they are not misled. They do not trust what the system developers tell them because the system developers have proved unreliable in the past. The users' opinion is that if it is something the system developers do not like they will not do it. This attitude should not prevail.

The system developers should be there for the business. In the end the business pays for the system. The users should be the people making the decisions about whether an addition or change is important or not, not the system developers. The system developers must start seeing business' point of view. The users and the system developers' work for the same organisation but every thing that must be done will cost.

In specific projects too many people, users and system developers, have been involved from the wrong areas and this has resulted in unproductive time. This was particularly true of the Joint Application Design (JAD) sessions.

Too much finger pointing was done by the system developers and the users. It should not matter who was responsible for a mistake. The mistake should be rectified. Users became disgruntled because system developers did not listen to them and merely waisted their time.

Much time and money were spent, and the users felt they had asked for specific programs at the initialisation of the project. The result is that nothing is done because the system developers constantly cut necessary parts of the system with the reason that it would delay implementation. The problem is that the users have to pay more to include those programs.

4.4.2 System developers:

The following is the opinion of one of the project managers. His point of view was not necessarily shared by the other system developers, but is very relevant to the research.

A business/systems analyst from the systems area should have separate sessions with the users and the system developers alone and then decide, based on outcome of the sessions.

System developers want to hear about the file layouts, etc. and not about the business as it is boring. The system developers see the end-users as clerks and are bored with the information. System developers do not care what happens to the clerk during normal working hours. They merely want the file layouts and program specifications. System developers do not care what business wants. They want to build databases and systems.

The above problem has been identified more than 20 years ago and has been mentioned by Ross (1977).

Others feel that there is a need for a methodology. There needs to be a structure. There needs to be some sort of common goal during the project. Business users and system developers must be on the same wavelength and time frame and they must have common levels of understanding.

A common level of understanding is extremely difficult to determine. According to Bjorn-Andersen *et al.* (1986) the majority of end-users are at a disadvantage when it comes to using a computer system because they are naïve with respect to the general properties for their use. The problem of inadequate knowledge and skills can be viewed as a general source of inhibition in the successful exploitation of a system. They attempt to solve this dilemma by training programs but feel that these training programs have a place in providing user support, but that they are not the universal solution. Users need 'point of need support', that is, help and advice on a particular issue at the time the user becomes aware that he/she needs help.

There must be a team. If they cannot work together as a team, they should not have been put together. There are different personalities and if a combination works it should be used for future projects.

A problem is that users always want the maximum as part of the project, which is not always feasible. This should be pointed out to them. It is not that the system developers want to tell them what not to do but rather what the restraints are.

Scott Morton (1991) identified the previous statement as a negative aspect of user involvement which had been revealed in several case studies. It includes the potential for incorporating too many bells and whistles. Realistic guidelines must be set for users. Management can avoid difficulties by establishing parameters for outcome specifications and boundaries for overall project cost and timetable. Allen and Scott Morton (1994) specify that users have a constraint or limitation, in that they are able to evaluate their need for a new product or an addition to an existing system. They are so used to the way things happen and cannot think along other lines.

The system is the users. If they are not proud of it and take responsibility it is not even useful to start the project.

Users must accept that the system developers have a strange nature.

The 'strange nature' is described by Feeny and Willcocks (1998) in some other words when they say that researchers have pointed to the difficulty in achieving dialogue between users and system developers and referred to it as more of a culture gap between "techies" and "users".

Users must be committed to the project from beginning to end. The users must be committed fully.

Commitment to an information systems development project is widely believed to affect the eventual success of the system according to Newman and Sabherwal (1996). Commitment has been defined as a state of mind that holds people and organisations in a line of behaviour. It encompasses psychological forces that bind an individual to an action as well as structural conditions that make behaviour irrevocable or it has been argued, to affect the persistence of behaviour greatly.

Commitment to an IS development project involves doing what is necessary throughout the stages of systems development, installation and use to assure that the problem is understood and that the system developers solve that problem. A high level of commitment to a systems project reflects the belief that the system will make a valuable contribution to the organisation. Without such a commitment, necessary resources may not be allocated. Therefore, the project may be abandoned midway or even before IS development begins.

The IS development process may simply be viewed as consisting of

a. the decision to develop the system, including identification of its scope, planning for its development, and commitment of requisite resources. These are followed by
b. the actual development of the system, including logical and physical design, programming, and testing

This unidirectional progression from decision making to IS development assumes the form of an "immaculate conception," in which the decision-makers are able to assess in advance, and hence plan for, problems and opportunities that may arise in IS development. However, in most practical situations, numerous unexpected problems

and opportunities occur in systems development necessitating further decisions about the system.

Users are the most important players in the project. The users included in the project must have experience. It should not include the odd user that was not involved at time of start of project or the most juniors users. The users are critical persons to a project. It is not numbers that count but the right type of user. Users must have power. They must be able to make decisions. The project should not have to wait because the user needs to clarify each decision with the sponsor. The user must also not have too much power. You still need a systems background for a system to really work.

According to Shimada and MacDuffie (1986) users and their input into the customisation of the system are workers bringing wisdom to the machine, and that user participation is a key facilitator. Kappelman and Mclean (1991) confirm that user participation in the development of Information Systems has long been considered critical to the successful implementation of systems.

4.5 Summary

There is obvious conflict between the users and system developers about the progress and results of the different projects.

System developers must be able to combine a mechanistic understanding of computing machines with a romantic appreciation of the complexity of human beings, social organisations, and information use.

The following chapter will summarise the research and research questions and come to a conclusion. Managerial guidelines and limitations of the research are also discussed.

CHAPTER 5: SUMMARY AND CONCLUSION

5.0 Introduction

This chapter consists of the summary of and conclusions drawn in this research. It summarises the impact user involvement had on the development of systems. It emphases the role the users play in system development and implementation, the benefits expected from the user involvement, what benefits were achieved and if benefits were not achieved, the possible reasons were for them not being achieved.

5.1 Examination of research questions

This section will examine each research question based on the findings discussed in the previous chapter. For clarification purposes the main research question and the associated sub-questions are revisited.

Main research question:

What impact does user involvement have on the development of systems within a major bank in South Africa?

Sub-questions:

1. What role do users play in systems development and implementation?
2. What benefits were expected from user involvement?
3. Which of these benefits were in fact achieved?
4. What anticipated benefits were not achieved by user involvement and what are the possible reasons?

5.1.1 Impact of user involvement on systems development

The impact of user involvement can be seen by viewing the different areas that form part of the definition of a successful system, then relating these areas of the definition to how user involvement can help achieve the definition of a successful system. To cover all user needs and wants, user involvement can be very beneficial by being able to supply the user needs and wants that must be met.

To achieve user-friendliness, user involvement can help by specifying what users understand and perceive to be user-friendly. The same applies to ease of use. For the system developer to decide on ease of use will not necessarily be easy to use. System developers are used to computers and their use. By involving the user, ease of use assumes a different meaning and should be addressed as such.

The area that addresses the fact that systems need to have problems after implementation does not only concentrate on hardware technical problems but also includes system requirement specifications. These can be overcome by user involvement in the SDLC and the specification of system requirements as well as verification of the requirements in the SDLC to effect fewer problems after implementation.

User involvement however is not only an easy task for users. Users also have to be adaptable and be prepared to use the system after delivery. The literature has indicated that users are more willing to accept and use a system once they were involved in the SDLC. The only concern is that users must sometimes go through a steep learning curve regarding participation and delivery of user requirements. They tend to exaggerate requirements when they are not trained and have no experience in producing necessary and valuable information to achieve a proper usable and successful system. On the other hand the system developers need to be trained to understand the thinking and interpretation of users.

The identification of the correct level of users in the different phases is also important. It collaborates the ability to train the users properly about the SDLC and their involvement.

Supervision should be a combined effort specifically to solve communication problems that arise between users and system developers.

User involvement also places emphasis on the need to respect and acknowledge user input. Without this acknowledgement and respect, the users might tend to feel rejected and valueless which can cause the withholding of information. Another important aspect of user involvement is to document all input properly, particularly to overcome specific problem areas, for example: When a system developer leaves the company and a new system developer is appointed in his/her place. This can eliminate cut out duplication of question sessions and the accompanying frustration.

5.1.2 Users role in system development and implementation

The users' role in the system development and implementation involves participation and involvement in the SDLC. The involvement starts when the user expresses the need for a system and then initiation of the system development after research about the feasibility of the development of the system.

The next area of user involvement is being able to participate and express requirements for the system at the design and specification process of the initiated system. This includes the initial high-level business process specifications down to the detailed requirement specifications as well as screen, report and form layout design and requirement specifications. It also includes involvement in the testing phase and determining of test data, involvement in the implementation and training of additional users in the use of the system.

The user must review all the above-mentioned requirements and determine if the ultimate system output and manipulation during system operation are the true requirements they needed and specified.

The process of user role does not stop here. On completion of above process, the user must take ownership of the system and use the system. The user must also stay involved in the further evolution and expansion of the system.

5.1.3 Benefits expected from user involvement

The benefits expected from user involvement can be summarised as the ability to achieve a successful system.

For the purpose of this research a successful system is defined as a system that covers the user needs, is easy to use, user-friendly and very reliable. The users must have bought into the system and be committed to using it and being satisfied with it.

More specifically the benefits are as follows:

- To achieve user needs in system development
- To achieve user-friendliness of system
- To achieve ease-of-use for the users
- To achieve user commitment to the system
- To achieve a system that is self-regulated and self-monitored by users
- To achieve a suitable, reliable and overall effective system according to user requirements
- To achieve a positive attitude from users to the system
- To achieve satisfied users
- To achieve a good working and personal relationship with the users
- To achieve a properly evaluated system
- To achieve a system that is accepted by users and used to its full capacity as well as helping with reducing and minimising the daily tasks of users

5.1.4 Benefits achieved by user involvement

The benefits achieved by user involvement were not clear-cut and definite. Different responses and opinions existed about the benefits that were actually achieved.

If the benefits achieved are compared to the reaction about the success of the systems, then only 50% felt that the benefits were achieved. Then the opinion was not only positive but also included 34% who felt the system could be defined both as successful and unsuccessful. The reason for the last opinion was that there was at least a system in place although not all functionality was represented or it was not working according to standards.

Generally more than 50% felt that proper checks were in place after the various phases in the SDLC. This is a positive sign, although it is not good enough.

Overall the users were very positive about being involved in the SDLC and it did create some trust and ownership acceptance for the systems.

It was mentioned that a major reason for some of the systems being used, although not necessarily classified as successful systems, was user involvement and the benefit factors mentioned above, that were addressed partially.

All benefits were not necessarily achieved 100% but were well on the way there. The general opinion was that all benefits were in fact achieved one way or another.

5.1.5 Benefits not achieved by user involvement

Benefits not achieved by user involvement were as unclear as the benefits actually achieved. 50% of the interviewees classified the system unsuccessful when compared to their definition of a successful system. There was also the 34% who had doubts about the comparison between the systems being successful or unsuccessful.

A definite benefit that was not achieved, according to the users, was the regular change in system development staff and the resultant difficulties. These difficulties were described in detail in chapter 4 and will not be elaborated on at this stage.

Commitment was another benefit not achieved as well as expected. Time constraints, workload and personal commitment were all factors involved in this non-achievement.

Another benefit not properly achieved was that of policies and methodologies not co-inciding and being adhered to. A possibility exists that proper training and understanding of these policies and methodologies would have had a different outcome.

Another unachieved benefit was understandable interpretation and communication between system developers and users. Communication lacked clearly stated ideas and the understanding and interpretation of the information available.

5.2 Management guidelines

From the above discussion the following management guidelines can be postulated.

- User involvement should be as broad as possible. Users at all levels involved in a project should be active throughout the project, from the sponsor, senior business analysts through to the end-users.
- Involvement should include users being responsible for phases throughout the SDLC. Sign-off and approval for key deliverables and milestones should be the responsibility of the users.

- To optimise the user involvement, value should be obtained by concentrating on specific users strengths, for example: The sponsor should concentrate on issues of strategic importance, such as information required to manage the business. The senior business analysts should concentrate on tactical issues, such as levels of control required in the system as well as detailing procedures. The end-users should contribute on operational activities, such as screen and report layouts, etc. But at the same time all information must be made available to all levels for evaluation and information purposes.
- Extreme care must be taken with the communication between users and system developers, not only on interpreting data relevant to the system being developed but also in general about personal interaction and commitment. Communication must never be underestimated. Both formal and informal communication must be given much attention.
- A very important factor is that of distributing information relevant to the project. Relevant information should be communicated at all times, especially information such as, who is in charge, what are the goals for a certain phase and what is required of each individual per phase. This should be stipulated explicitly and presented to all relevant parties in a proper manner.
- Training should be planned and executed in a proper formal format to gain value and to ascertain user acceptance and use. Training should include training to users about their involvement and the concepts of the SDLC.
- It is very important to identify the correct level of users in the different phases of the SDLC.

5.3 Aims and objectives of the research

Based on the discussion in the previous sections in this chapter, the question arises whether or not the aims and objectives of the research project have been satisfied.

The aim to examine and analyse four different system development projects within a major bank in South Africa with the objective of determining different levels of user involvement and the effect of this involvement on the success, or otherwise, of the actual systems, was achieved.

The aim of the research to focus on the role users play in the system development and implementation was also achieved. The important issues of the user contributions and efforts were also addressed.

The objectives about expectations and expectation levels of the users and the system developers were also addressed. The above section describes the expectations and benefits as well as defining the expectations that were met and those that were not met and the reasons for them not being met.

The research aim to provide evidence that even though a system is in use does not necessarily make it successful and that user participation plays an important role, was achieved and discussed in the previous section.

5.4 Limitations of the research

5.4.1 Sample size of the number of projects

The sample size was relatively small and limited by the number of participants on the projects and the time span of the projects. The possibility exists that the outcome would be different with an increase in number of participants and the time span of the projects.

5.4.2 Sample size of the number of interviewees

The sample size of interviewees was small and limited by time and cost. The interviewees were busy and had limited time to their disposal. There was also the factor of experience that varies between interviewees as well as personal experience and responses.

5.4.3 Analysis and presentation of the data

Analysis and presentation of data was done with an open mind but a possibility exists that interpretation could have been done differently by another person and that presentation might be viewed and understood differently.

5.4.4 Questionnaire interpretation

Although a semi-structured interview method was used, the interviewer could still have imposed her own frame of reference on the interviewee, both when asking the questions and interpreting the answers. The semi-structured interview method did control this since it posed open questions instead of leading questions.

5.4.5 Limitation of time

Although an enormous amount of time was spent on the research, it will never be enough. With more time, a different perception could have been formed or even new or different information could have come to light.

5.5 Areas for further research

This section highlights some areas where further research is suggested.

- The effect of communication during user involvement in the SDLC needs attention and not only formal and informal reporting structures but also personal communication.

- The effect of culture on user involvement must be explored. Organisational culture, "level" culture and "gap" culture should be included. "Level" culture can be seen as the culture that exists in positions. For example: being an end-user versus a sponsor. "Gap" culture refers to the culture gap between system developers and users.
- This research has concentrated on specific-sized projects with certain characteristics. This should be explored in different types of projects with different characteristics.
- Training required to the involve users in the SDLC.
- Identification of correct level of users during the different phases of the SDLC.

5.6 Summary and conclusion

In attaining these aims and objectives of this research the following questions were posed.

Main research question:

What impact does user involvement have on the development of systems within a major bank in South Africa?

In addressing this question the following sub-questions were answered.

Sub-questions:

1. What role do users play in systems development and implementation?
2. What benefits were expected from user involvement?
3. Which of these benefits were in fact achieved?
4. What anticipated benefits were not achieved by user involvement and what are possible reasons for this?

This research analysed four different system development projects within a major bank in South Africa with the objective of determining different levels of user involvement and the effect of this involvement on the success or otherwise of the actual systems. It also establishes an understanding of issues surrounding the involvement of users in the systems development life cycle and gains an insight into the complexity of this.

The focus was on the role users play in the system development and implementation. The important issues of the user contributions and efforts were also addressed. The objectives about expectations and expectation levels of the users and the system developers were also addressed

There is obvious conflict between the user feeling and system developer opinions about the progress and results of the different projects. System developers must be able to combine a mechanistic understanding of computing machines with a romantic

appreciation of the complexity of human beings, social organisations, and information use.

The research provided evidence that even though a system is in use, it does not necessarily make it successful and that user participation plays an important role in the SDLC.

LIST OF REFERENCES

Adams D.A. Nelson R.R. Todd P.A. (1992), Perceived Usefulness, Ease of use, and Usage of Information Technology: A Replication. *MIS Quarterly*, June

Allen T.J. Scott Morton M.S. (1994*), Information Technology and the corporation of the 1990's - Research studies*. Oxford University Press. New York, Oxford.

Allingham P. O'Connor M (1992), MIS success: Why does it vary among users? *Journal of Information Technology*, Vol 7.

Appleton E.L. (1993), Put usability to the test. *Datamation.* Vol39. July15.

Barki H. Hartwick J. (1994:a), Explaining The Role of User Participation in IS Use *Management Science*, Vol. 40. No.4.

Barki H. Hartwick J. (1994:b), Measuring user participation, user involvement, and user attitude. *MIS Quarterly*, March.

Barki H. Hartwick J. (1989), Rethinking the Concept of User Involvement. *MIS Quarterly*, March.

Baronas A.K. Louis M.R. (1988), Restoring a Sense of Control During Implementation: How User Involvement Leads to System Acceptance. *MIS Quarterly*, March.

Basili V.R. Caldiera G. (1995), Improve Software Quality by Reusing Knowledge and Experience. *Sloan Management Review*, Fall.

Bjorn-Andersen N. Eason K. Robey D. (1986), *Managing Computer Impact - An international Study of Management and Organizations.* Ablex Publishing Corporation. New Jersey.

Brancheau J.C. Janz B.D. Wetherbe J.C. (1996), Key Issues in Information Systems Management: 1994-1995 SIM Delphi Results. *MIS Quarterly*, June.

Broadbent M. Weill P. (1997), Management by Maxim: How Business and IT Managers can create IT Infrastructures. *Sloan Management Review*, Spring.

Byrd T.A. Cossick K.L. Zmud R.W. (1992), A Synthesis of Research on Requirements Analysis and Knowledge Acquisition Techniques. *MIS Quarterly*, March.

Campleman C.G. (1985*), The impact of end user computing, unpublished MBA dissertation*, University of the Witwatersrand.

Cash J.I. McFarlan F.W. McKenney J.L. (1988), *Corporate information systems management: The issues facing senior executives*. Dow Jones-Irwin. Illinois.

Cash J.I. McFarlan F.W. McKenney J.L. Applegate L.M. (1992), *Corporate information systems management: Text and cases*. Richard D Irwin. Illinois.

Cavaye A. (1995), User Participation in Systems Development Revisited. *Information and Management*, Vol 28.

Chidambaram L. (1996), Relational Development in Computer-Supported Groups. *MIS Quarterly*, June.

Danziger J.N. (1986), *People and computers - The impact of computing on end users in organisations*, Columbia University Press. New York.

Davenport T.H. Jarvenpaa S.L. Beers M.C. (1996), Improving Knowledge Work Processes. *Sloan Management Review*, Summer.

Davis F.D. (1989), Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information technology. *MIS Quarterly*, September.

DeLone W.H. McLean E.R. (1992), Information Systems Success: The Quest for the Dependent Variable. *Information Systems Research3:1* March.

Dodd J.L. Carr H.H. (1994), Systems Development led by End-users: An assessment of end-user involvement in Information Systems Development. *IS Management*, August.

Doll W.J. Torkzadeh G. (1988), The measurement of end-user computing satisfaction. *MIS Quarterly*, June.

Doll W.J. Torkzadeh G. (1989), A Discrepancy Model of End-user Computing Involvement. *Management Science*, Vol 35 no.10.

Dunlop C. Kling R. (1991), *Computerization and controversy - Value conflicts and social choices*. Academic press, inc. Hartcourt Brace Jovanovich, Publishers.

Easterby-Smith M. Thorpe R. Lowe A. (1991), *Management Research - An introduction*. SAGE Publications Ltd. London.

Edwards C. Ward J. Bytheway A. (1992), *The Essence of Information Systems*. Prentice Hall. UK.

Eisner E.W. (1991), *The enlightened eye: Qualitative inquiry and the enhancement of educational practice*, McMillan Publishing, New York, cited in Leedy (1993).

Emery J.C. (1991), On End-User Computing Satisfaction. *MIS Quarterly*, March.

Etezadi-Amoli J. Farhoomand A.F. (1991), The Measurement of End-user Computing Satisfaction: Theoretical and Methodological Issues. *MIS Quarterly*, March.

Evans P.A. Bailey J.E. Moor W.C. Roberts A.L. (1988), An instrument for measuring effectiveness of Information Systems. *Computers ind. Engng.* Vol 14 no 3.

Feeny D.F. Willcocks L.P. (1998), Core IS Capabilities for Exploiting Information Technology. *Sloan Management Review*, Spring.

Ford J.C. (1993), *Information Technology 2000.* NACCA Symposium. South Africa.

Franz C.R. Robey D. (1986), Organizational context, user involvement, and the usefulness of information systems. *Decision Sciences.* Vol 17.

Frenzell C.W. (1992), *Management of Information Technology.* Boyd and Fraser. Boston.

Friedman A.L. (1993), *Computer systems development - History, organisation and implementation.* John Wiley & Sons. New York.

Galletta D.F. Lederer A.L. (1989), Some caution on the measurement of user information satisfaction. *Decision Sciences.* Vol 20.

Galliers R.D. Baker B.S.H. (1994), *Strategic Information Management - Challenges and strategies in managing information systems.* Butterworth-Heinemann Ltd. Linacre House, Oxford.

Gattiker U.E. Gutek B. Berger D. (1988), Office Technology and employee attitudes. *Social Science Computer Review*, Vol 6.

Gattiker U.E. Howg L.W. (1990), Information technology and quality of work life: Comparing users with non-users. *Journal of Business and Psychology*, Vol 5.

Gattiker U.E. (1992), Computer Skills Acquisition: A review and future directions for research. *Journal of Management*, Vol 18.

Gattiker U.E. Kelley H.P. Bathnagar D. (1995), *Information systems and end-user attitudes: A comparison of employees from three countries.* A working paper. The University of Lethbridge.

Goldsborough R. (1994), *Straight Talk about the Information Superhighway.* Alpha books. Indianapolis, Indiana.

Griffith T.L. Northcraft G.B. (1996), Cognitive Elements in the Implementation of New Technology: Can Less Information Provide More Benefits. *MIS Quarterly*, March.

Hamilton S. Chervany N.L. (1981), Evaluating information system effectiveness - Part II: Comparing evaluator viewpoints. *MIS Quarterly*. December.

Hendrickson A.R. Massey P.D. Cronan T.P. (1993), On the Test-Restest reliability of perceived usefulness and perceived ease of use scales. *MIS Quarterly*, June.

Ives B. Olson M.H. Barboudi J.J. (Oct 1983), The measurement of user information satisfaction. *Communications of the ACM*. Vol 26 number 10.

Jarke M. (1986), *Managers, Micros and Mainframes - Integrating Systems for End-users*. John Wiley & Sons. New York.

Jarvenpaa S.L. Ives B. (1991), Executive Involvement and Participation in the Management of Information Technology. *MIS Quarterly*, June.

Joshi K. (1989), The measurement of Fairness or Equity Perceptions of Management Information Systems Users. *MIS Quarterly*, September.

Joshi K. (1991), A Model of Users' Perceptive on Change: The Case of Information Systems Technology Implementation. *MIS Quarterly*, June.

Kappelman L.A. Mclean E.R. (1991), *"The Respective Roles of User Participation and User Involvement in Information Systems Implementation Success"*, Proceedings, 12th International Conference on Information Systems.

Kendall K.E. Lyytinen K. Degross J.I. (1992), *The impact of computer supported technologies on information systems development*. North-Holland. Amsterdam.

Lawrence M. Low G. (1993), Exploring individual user satisfaction within user-led development. *MIS Quarterly*. June.

Leedy P.D. (1993), *Practical Research - Planning and design*. Macmillan Publishing Company. New York.

Leyland F.P. Watson R.T. Kavan C.B. (1995), Service Quality: A measure of Information Systems Effectiveness. *MIS Quarterly*. June.

Liedtka J.M. Haskins M.E. Rosenblum J.W. Weber J. (1997), The Generative Cycle: Linking Knowledge and Relationships. *Sloan Management Review*, Fall.

Markus M.L. Keil M. (1994), If we build it, They will come: Designing Information Systems that people want to use. *Sloan Management Review*, Summer.

Martin E.W. Dehayes D.W. Hoffer J.A. Perkins W.C. (1994), *Managing Information Technology - What managers need to know*. Prentice Hall. New Yersey.

Martin J. (1982) *Application development without programmers*. Prentice Hall. New Jersey.

McKeen J.D. Guimaraes T. Wetherbe J.C. (1994), The relationship between user participation and user satisfaction: An investigation of four contingency factors. *MIS Quarterly*, December.

Menkus B. (1987), Five hallmarks of successful systems. *Journal of Systems Management.* August.

Montaniz F. Kissel G.V. Authored: April 1996 Last Update: April 1996 File Size: 64K, Reversing the Charges. *ACM Interaction Magazine.*

Niederman F. Beise C.M. Beranek P.M. (1996), Issues and Concerns About Computer-Supported Meeting: The Facilitator's Perspective. *MIS Quarterly*, March.

Newman M. Robey D. (1992), A Social Process Model of User-Analyst Relationships. *MIS Quarterly*, June.

Newman M. Sabherwal R. (1996), Determinants of Commitment to Information Systems Development: A Longitudinal Investigation. *MIS Quarterly* March.

Pitt L.F. Watson R.T. Kavan C.B. (1995), Service Quality: A Measure of Information Systems Effectiveness. *MIS Quarterly*. June.

Reich B.H. Benbasat I. (1996), Measuring the Linkage Between Business and Information Technology Objectives. *MIS Quarterly*, March.

Reichheld F.F. (1996), Learning from customer defections. *Harvard Business Review,* March-April.

Remenyi D.S.J. Money A.H. (1994), Service quality and correspondence analysis in determining problems with the effective use of computer services. *Eur. J. Inf. Systs.* Vol 3. No 1.

Remenyi D. Money A. Twite A. (1995), *Effective measurement & management of IT costs and benefits*. Butterworth-Heinemann.

Ross J.E. (1977), *Modern Management and Information Systems*. London.

Rubenstein A.H. (1989), *Managing technology in the decentralized firm*. John Wiley & Sons. New York.

Rushinek A. Rushinek S.F. (1986), What makes users happy? *Communications of the ACM.* Vol 29. No 7. July.

Schrage M. (1997), The Real Problem with Computers. *Harvard Business Review*, September-October.

McKeen J.D. Guimaraes T. Wetherbe J.C. (1994), The relationship between user participation and user satisfaction: An investigation of four contingency factors. *MIS Quarterly*, December.

Menkus B. (1987), Five hallmarks of successful systems. *Journal of Systems Management*. August.

Montaniz F. Kissel G.V. Authored: April 1996 Last Update: April 1996 File Size: 64K, Reversing the Charges. *ACM Interaction Magazine*.

Niederman F. Beise C.M. Beranek P.M. (1996), Issues and Concerns About Computer-Supported Meeting: The Facilitator's Perspective. *MIS Quarterly*, March.

Newman M. Robey D. (1992), A Social Process Model of User-Analyst Relationships. *MIS Quarterly*, June.

Newman M. Sabherwal R. (1996), Determinants of Commitment to Information Systems Development: A Longitudinal Investigation. *MIS Quarterly*, March.

Pitt L.F. Watson R.T. Kavan C.B. (1995), Service Quality: A Measure of Information Systems Effectiveness. *MIS Quarterly*. June.

Reich B.H. Benbasat I. (1996), Measuring the Linkage Between Business and Information Technology Objectives. *MIS Quarterly*, March.

Reichheld F.F. (1996), Learning from customer defections. *Harvard Business Review*, March-April.

Remenyi D.S.J. Money A.H. (1994), Service quality and correspondence analysis in determining problems with the effective use of computer services. *Eur. J. Inf. Systs*. Vol 3. No 1.

Remenyi D. Money A. Twite A. (1995), *Effective measurement & management of IT costs and benefits*. Butterworth-Heinemann.

Ross J.E. (1977), *Modern Management and Information Systems*. London.

Rubenstein A.H. (1989), *Managing technology in the decentralized firm*. John Wiley & Sons. New York.

Rushinek A. Rushinek S.F. (1986), What makes users happy? *Communications of the ACM*. Vol 29. No 7. July.

Schrage M. (1997), The Real Problem with Computers. *Harvard Business Review*, September-October.

Scott J.E. (1994), The measurement of Information Systems effectiveness: Evaluating a measuring instrument. *Proceedings of the fifteenth International Conference on Information Systems*. December 14-17.

Scott Morton M.S. (1991), *The Corporation of the 1990s - Information Technology and Organizational Transformation*. Oxford.

Shimada H. Macduffie J.P. (1986), Industrial Relations and 'Humanware'. *MIT Sloan School of Management working paper.*

Stephens C.S. (1995), *The Nature of Information Technology Managerial Work.* Quorum Books. London.

Synnott R. Gruber W.H. (1881), *Information Resource Management - Opportunities and strategies for the 1980's*. John Wiley & Sons. New York.

Symon S. (1983), *Legal aspects of computer contracts from a user perspective*, unpublished MBA dissertation, University of the Witwatersrand.

Tait P. Vessey I (1988), The effect of user involvement on system success: A contingency approach. *MIS Quarterly,* March.

Thierauf R.J. (1988), *User-oriented decision support systems.* Prentice Hall. London.

Trauth E.M. Cole E. (1992), The organisational interface: A method for supporting end users of packaged software. *MIS Quarterly*, March.

Turban E. (1993), *Decision Support and Expert Systems - Management Support Systems.* MacMillan Publishing Company. New York.

Wagner J.A. (1994), Participation's effects on performance and satisfaction: A reconsideration of research evidence. *Academy of Management Review.* Vol 19, No 2.

Ward J. Griffiths P. Whitmore P. (1994), *Strategic Planning for Information Systems.* John Wiley and Sons. New York.

Wiid M.G. (1987), *The viability of end user computing in the financial services sector*, unpublished MBA dissertation, University of the Witwatersrand.

Wildman D. Authored: April 1996 Last Update: April 1996 File Size: 48K, Getting the most from paired-user testing. *ACM Interaction Magazine.*

APPENDIX A (1): USERS' QUESTIONNAIRE

Question 1:
How would you describe a successful system? - Prompt (reliability, adaptability, user-friendly, availability, easy to use, easy to learn from scratch, measured to an SLA, response times, cost recovery after period of time, return on investment after period of time)

Question 2:
Keeping your previous answer in mind, do you view this project as resulting in a successful system?

Question 3:
Who initiated the project? - Prompt (business/systems)

Question 4:
Who do you think should initiate projects? - Prompt (business/systems)

Question 5:
Who supervised the project? - Prompt (business/systems)

Question 6:
If the other party would have supervised, could the results have been better?

Question 7:
In your opinion, where the right level of users involved?

Question 8:
If not, who should have been involved, or should there have been more involvement?

Question 9:
Did you follow a phased approach?

Question 10:
Were there checks in place after each phase? (If applicable)

Question 11:
How do you view the success of the phased approach (if applicable)?

Question 12:
What parts of the life cycle where you involved in? - Prompt (requirement phase, feasibility study, system analysis and conceptual design, physical design and construction, testing, operation, maintenance, post audit.)

Question 13:
How do you feel about being involved in the development life cycle?

Question 14:
Did it help being involved? - Prompt (ability to validate at end of each phase (described above), where you more satisfied with end result)

Question 15:
Did you have goals to achieve? What was expected from you? - Prompt (provide business perception, JAD participation, involvement in documentation, Standards, testing, prototyping, screen/report/form design.)

Question 16:
Did you meet these goals?

Question 17:
If no goals specified, do you believe there should have been goals?

Question 18:
Where you involved in testing? - Prompt (UAT, program testing, and what testing)

Question 19:
Did it help being involved?

Question 20:
Who determined the test data?

Question 21:
Who did the training?

Question 22:
Who wrote the training manuals?

Question 23:
Who wrote the operations manuals?

Question 24:
Was it sufficient and covering everything?

Question 25:
Did you feel you added value?

Question 26:
Was your participation recognised? (Systems people / sponsor)

Question 27:
Where you allowed giving enough input?

Question 28:
Was your input taken seriously?

Question 29:
Did you feel you needed to be more involved?

Question 30:
Were you satisfied with your involvement?

Question 31:
Were the end results satisfactory and what you expected?

Question 32:
Do you feel you have more confidence using the end product by being involved?

Question 33:
Were you asked to give feedback on the end product?

Question 34:
How do you view your relationship with the developers?

APPENDIX A (2): SYSTEM DEVELOPERS' QUESTIONNAIRE

Question 1:
How would you describe a successful system? - Prompt (reliability, adaptability, user-friendly, availability, easy to use, easy to learn from scratch, measured to an SLA, response times, cost recovery after period of time, return on investment after period of time)

Question 2:
Keeping your previous answer in mind, do you view this project as resulting in a successful system?

Question 3:
Who initiated the project? - Prompt (business/systems)

Question 4:
Who do you think should initiate projects? - Prompt (business/systems)

Question 5:
Who supervised the project? - Prompt (business/systems)

Question 6:
If the other party would have supervised, could the results have been better?

Question 7:
In your opinion, did you have the right level of users involved?

Question 8:
If not, who should have been involved, or should there have been more involvement?

Question 9:
Did you follow a phased approach?

Question 10:
Were there checks in place after each phase? (If applicable)

Question 11:
How do you view the success of the phased approach? (If applicable)

Question 12:
What parts of the life cycle where the users involved in? - Prompt (requirement phase, feasibility study, system analysis and conceptual design, physical design and construction, testing, operation, maintenance, post audit.)

Question 13:
How do you feel about involving users in development life cycle?

Question 14:
Did it help involving the users? - Prompt (ability to validate at end of each phase (described above), where you more satisfied with end result)

Question 15:
In your opinion, did they have goals to achieve? What was expected from them? - Prompt (provide business perception, JAD participation, involvement in documentation, standards, testing, prototyping, screen/report/form design.)

Question 16:
In your opinion, did they meet these goals?

Question 17:
In your opinion, if no goals specified, do you believe there should have been goals?

Question 18:
Were they involved in testing? - Prompt (UAT, program testing, and what testing)

Question 19:
Did it help involving them?

Question 20:
Who determined the test data?

Question 21:
Who did the training?

Question 22:
Who wrote the training manuals?

Question 23:
Who wrote the operations manuals?

Question 24:
In your opinion, was it sufficient and covering everything?

Question 25:
Did the users add value?

Question 26:
Was the users' participation recognised?

Question 27:
Were they allowed to give enough input?

Question 28:
Was their input been taken seriously?

Question 29:
Did you feel they needed to be more involved?

Question 30:
Were you satisfied with their involvement?

Question 31:
Were the end results what they expected?

Question 32:
Do they feel more confident using the end product by being involved?

Question 33:
Were they asked to give feedback on the end product?

Question 34:
How do you view your relationship with the users?

APPENDIX B (1): INDIVIDUAL USER QUESTIONS RESULTS

This appendix presents the summary results for the individual users interview questions.

Question 1:
How would you describe a successful system? - Prompt (reliability, adaptability, user-friendly, availability, easy to use, easy to learn from scratch, measured to an SLA, response times, cost recovery after period of time, return on investment after period of time)

1. Summarised description from Users:

No. of responses	%	Description
12	100	A system that will cover all user needs.
12	100	A system that is user friendly.
10	83	A system that is reliable.
9	75	A system that is available at all times.
9	75	A system with good response times.
8	67	A system that is adaptable.
6	50	A system that can recover costs within maximum of three years.
6	50	A system that is supported by a SLA.
5	42	A system that anybody can use.
4	33	A system not necessarily necessary to be easy to learn from scratch, a difficult system once you know how to use it becomes easy to use.
4	33	Where unsure about how necessary to recover costs - not their line.
1	8	A system that has few problems occurring after implementation.
1	8	Everyone should commit himself to the project.

Question 2:
Keeping your previous answer in mind, do you view this project as resulting in a successful system?

No. of responses	%	Description
2	17	Yes
6	50	No
4	33	Yes and no

Question 3:
Who initiated the project? - Prompt (business/systems)

No. of responses	%	Description
11	92	Business area
1	8	Systems area (an end users feelings)

Question 4:
Who do you think should initiate projects? - Prompt (business/systems)

No. of responses	%	Description
8	67	Business area
1	8	Essentially business area but also the systems area if it is mandatory because of compliance regulations.
3	25	Business area or systems area.

Question 5:
Who supervised the project? - Prompt (business/systems)

No. of responses	%	Description
1	8	Business area
8	67	Business area and systems area jointly supervised the project.
3	25	Initially the business area but the last part of the project the systems area.

Question 6:
If the other party would have supervised, could the results have been better?
This table relates to above question:

No. of responses	%	Description	Changes	%	Result
1	8	Business area			
8	67	Business and Systems area jointly supervised the projects	2	17	1. Will be more focused if only committed to one supervisor. 2. Business to be more involved in supervision of the project.
3	25	Initially the business area but the last part of the project the systems area.			

Question 7:
In your opinion, where the right level of users involved?

No. of responses	%	Description
3	25	Yes
4	33	Not initially, but later on definitely
5	42	Half of them, yes, half of them, no.

Question 8:
If not, who should have been involved, or should there have been more involvement?

No. of responses	%	Description
4	33	Not applicable
3	25	Too little qualified end-users involved
3	25	End-users must be involved earlier in the project.
2	17	Managerial users to involved and should be only involved in specific areas.

Question 9:
Did you follow a phased approach?

No. of responses	%	Description
12	100	Yes

Question 10:
Were there checks in place after each phase? (If applicable)

No. of responses	%	Description
6	50	Yes.
3	25	Not initially, but later on in the project, yes.
2	17	Yes, but it was not sufficient.
1	8	Yes, but they were not really used.

Question 11:
How do you view the success of the phased approach (if applicable)?

No. of responses	%	Description
3	25	It allows putting a structure in place.
3	25	Help the project to be successful much faster.
3	25	Phase by phase you can establish needs and get to agree before continuing too far. Very good for project to clear everything this way.
1	8	This project it was not so good but it has value if properly followed.
2	17	If followed properly it can work well.

Question 12:
What parts of the life cycle where you involved in? - Prompt (requirement phase, feasibility study, system analysis and conceptual design, physical design and construction, testing, operation, maintenance, post audit.)

No. of responses	%	Description
9	75	Requirement phase
6	50	Feasibility study
11	92	System analysis
0	0	Prototyping
4	33	Setting up of documentation
8	67	Testing
1	8	Only part of testing at end when trouble started
2	17	Design and construction
2	17	Post audit

Question 13:
How do you feel about being involved in the development life cycle?

No. of responses	%	Description
1	8	It was not adequately addressed, if it was it could have been great for the end result.
3	25	It felt great to be involved
4	34	Were able to say what users needed and not just use what was given and then had to make it work.
3	25	Good idea, because no one can force a user to use a system, but by involving the users you make them more committed.
1	8	Enjoyed it thoroughly.

Question 14:
Did it help being involved? - Prompt (ability to validate at end of each phase (described above), where you more satisfied with end result)

No. of responses	%	Description
1	8	Not during this project
9	75	Yes, able to give input
8	67	Yes, able to verify interpretation is correct
6	50	Yes, able to check end results
1	8	Only during beginning of the project.

Question 15:
Did you have goals to achieve? What was expected from you? - Prompt (provide business perception, JAD participation, involvement in documentation, standards, testing, prototyping, screen/report/form design.)

No. of responses	%	Description
8	67	Business Perception
12	100	JAD participation
6	50	Documentation
0	0	Standards
8	67	Testing
0	0	Prototyping
11	92	Screen/report/form design

Question 16:
Did you meet these goals?

No. of responses	%	Description
3	25	Yes
2	17	Yes, but not without some difficulty
4	33	Yes and no
3	25	No - involvement not adequate

Question 17:
If no goals specified, do you believe there should have been goals?

No. of responses	%	Description
12		Not applicable

Question 18:
Where you involved in testing? - Prompt (UAT, program testing, and what testing)

No. of responses	%	Description
8	67	UAT
5	42	Program testing
4	33	Not involved

Question 19:
Did it help being involved?

No. of responses	%	Description
2	17	Was involved too late but it helped a bit.
5	42	Yes
1	8	Some of the testing, not all of it.
4	33	Not applicable

Question 20:
Who determined the test data?

No. of responses	%	Description
3	25	System developers
2	17	Users
3	25	Users and system developers
4	33	Do not know

Question 21:
Who did the training?

No. of responses	%	Description
2	17	System developers
3	25	Users
2	17	System developers but with the involvement of the users
1	8	System developers and users
4	33	Do not know

Question 22:
Who wrote the training manuals?

No. of responses	%	Description
3	25	System developers
3	25	No training manuals exists
3	25	Users
3	25	Do not know

Question 23:
Who wrote the operations manuals?

No. of responses	%	Description
8	67	System developers
1	8	System developers and the users
3	25	Do not know

Question 24:
Was it sufficient and covering everything?

No. of responses	%	Description
1	8	Do not know
4	33	Yes
1	8	Hopefully
2	18	Do not know, have not seen it yet.
3	25	No
1	8	We use the training manuals, so would not know.

Question 25:
Did you feel you added value?

No. of responses	%	Description
12	100	Yes

Question 26:
Was your participation recognised? (Systems people / sponsor)

No. of responses	%	Description
8	67	They sure did, but it was not shown
2	17	Yes
1	8	Not yet.
1	8	No, definitely not from management side

Question 27:
Where you allowed giving enough input?

No. of responses	%	Description
2	17	No
3	25	Yes and no
7	58	Yes

Question 28:
Was your input taken seriously?

No. of responses	%	Description
4	33	Not always
4	33	Yes
1	9	Hopefully
3	25	Yes and no, some input was not part of the output.

Question 29:
Did you feel you needed to be more involved?

No. of responses	%	Description
5	42	Yes
4	33	No
3	25	Yes, from the point of view that certain criteria were left out without being able to fight for it.

Question 30:
Were you satisfied with your involvement?

No. of responses	%	Description
1	8	No, too much additional work not related to the project.
3	25	Yes and no. No because of lack of all input in the output
2	17	No
1	8	Yes, but only to the bit we were allowed
1	8	Not initially
4	34	Yes

Question 31:
Were the end results satisfactory and what you expected?

No. of responses		Description
1	8	No, to many disappointments
1	8	Yes, but there was disappointments as well
2	18	Yes
4	33	Yes and no.
4	33	No

Question 32:
Do you feel you have more confidence using the end product by being involved?

No. of responses	%	Description
3	25	Could work with the end product but because it was not what was really asked for, no.
9	75	Yes

Question 33:
Were you asked to give feedback on the end product?

No. of responses	%	Description
1	8	Not explicit
11	92	No

Question 34:
How do you view your relationship with the developers?

No. of responses	%	Description
5	42	Good
1	8	Good, although not initially but it ended great.
6	50	No problem with the people as such, just an attitude problem that created vibes of "users lack technical knowledge and should "back off" and they are not the decision makers but the system developers are"

APPENDIX B (2): INDIVIDUAL SYSTEM DEVELOPERS QUESTIONS RESULTS

This appendix presents the summary results for the individual system developers interview questions.

Question 1:
How would you describe a successful system? - Prompt (reliability, adaptability, user-friendly, availability, easy to use, easy to learn from scratch, measured to an SLA, response times, cost recovery after period of time, return on investment after period of time)

1. Summarised description from system developers:

No. of responses	%	Description
12	100	A system that is what the users wanted.
12	100	A system that is user-friendly.
10	83	A system must have few problems occurring after implementation, if a flood of changes comes through it is not a successful system.
9	75	A system that is easy to learn but not 'spoon-fed' easy.
9	75	A system that is very reliable.
9	75	A system with good response times.
8	67	A system that is 100% available during working hours excluding the maintenance time specified up-front.
8	67	A system that is easy to use.
6	50	A system where cost recovery can be achieved within three years.
5	42	A system that is fairly adaptable.
4	33	A system supported by a SLA.
3	25	Where unsure how necessary it is to recover costs - not their line.
1	8	A system that is stable

Question 2:
Keeping your previous answer in mind, do you view this project as resulting in a successful system?

No. of responses	%	Description
2	17	Yes
6	50	No
4	33	Yes and no

Question 3:
Who initiated the project? - Prompt (business/systems)

No. of responses	%	Description
12	100	Business area.

Question 4:
Who do you think should initiate projects? - Prompt (business/systems)

No. of responses	%	Description
4	33	Business area
8	67	Business area although there is certain times where systems area must mention when a need arise for new development.

Question 5:
Who supervised the project? - Prompt (business/systems)

No. of responses	%	Description
6	50	Joint effort between Business and Systems areas.
4	33	Systems area
8	67	Joint effort between business area and systems area

Question 6:
If the other party would have supervised, could the results have been better?

No. of responses	%	Description
12	100	No

Question 7:
In your opinion, did you have the right level of users involved?

No. of responses	%	Description
4	33	Yes
1	8	To many users involved, created too much extra work.
5	42	No
2	17	No, they were just assigned to the project and had to use them

Question 8:
If not, who should have been involved, or should there have been more involvement?

No. of responses	%	Description
4	33	Not applicable
1	8	More senior users that know the policies of the organisation
2	17	Should be able to choose who should be involved.
2	17	More end-users that knows the products
3	25	More committed users.

Question 9:
Did you follow a phased approach?

No. of responses	%	Description
11	92	Yes
1	8	Do not think so

Question 10:
Were there checks in place after each phase? (If applicable)

No. of responses	%	Description
1	8	Not officially
2	17	Do not think so
1	8	Yes, but checks were not really used
8	67	Yes

Question 11:
How do you view the success of the phased approach? (If applicable)

No. of responses	%	Description
1	8	Should be close to the sponsor of the project and provide regular feedback to management and get regular feedback from the team
2	17	Have never seen it work
2	17	Gives structure to the project
5	41	Are able to stop project early if there is not enough acceptance from users
2	17	Business and systems can learn to communicate

Question 12:
What parts of the life cycle where the users involved in? - Prompt (requirement phase, feasibility study, system analysis and conceptual design, physical design and construction, testing, operation, maintenance, post audit.)

No. of responses	%	Description
8	67	Requirement phase
6	50	Feasibility study
11	92	Systems analysis
0	0	Prototyping
2	17	Setting up of documentation
9	75	Testing
0	0	Design and construction
2	17	Post audit

Question 13:
How do you feel about involving users in development life cycle?

No. of responses	%	Description
2	17	Depends on the project - This project they needed to give input only but not get too involved
1	8	Enjoyed it very much
3	25	Help to clear problems continuously
1	8	Involving users to early in the project just extends project
2	17	Feels strongly about involving users, It is an essential component
3	25	Should involve users to achieve what systems are after

Question 14:
Did it help involving the users? - Prompt (ability to validate at end of each phase (described above), where you more satisfied with end result)

No. of responses	%	Description
1	8	No, project was wrong from the start
8	67	Able to give input
6	50	Able to verify interpretation is correct
5	42	Able to check end results
1	8	No, to much time lost

Question 15:
In your opinion, did they have goals to achieve? What was expected from them? - Prompt (provide business perception, JAD participation, involvement in documentation, standards, testing, prototyping, screen/report/form design.)

No. of responses	%	Description
7	58	Business perception
12	100	JAD participation
5	42	Documentation
0	0	Standards
8	67	Testing
0	0	Prototyping
11	92	Screen/report/form design

Question 16:
In your opinion, did they meet these goals?

No. of responses	%	Description
6	50	Yes
1	8	Some of it
1	8	Not adequately, had to think about a lot that was left out
3	26	No
1	8	There was problems but in the end it worked out

Question 17:
In your opinion, if no goals specified, do you believe there should have been goals?

No. of responses	%	Description
12		Not applicable

Question 18:
Were they involved in testing? - Prompt (UAT, program testing, and what testing)

No. of responses	%	Description
8	67	UAT
4	33	Not applicable
5	42	Program testing

Question 19:
Did it help involving them?

No. of responses	%	Description
1	8	In a way
8	67	Yes
3	25	No

Question 20:
Who determined the test data?

No. of responses	%	Description
5	42	Users
4	33	System developers
3	25	Users and system developers

Question 21:
Who did the training?

No. of responses	%	Description
3	25	System developers and users
3	25	Users
3	25	Systems
3	25	Do not know

Question 22:
Who wrote the training manuals?

No. of responses	%	Description
3	25	Do not know
4	33	System developers
3	25	No training manuals
2	17	Users

Question 23:
Who wrote the operations manuals?

No. of responses	%	Description
9	75	Systems
3	25	Do not know

Question 24:
In your opinion, was it sufficient and covering everything?

No. of responses	%	Description
1	8	No the project failed
4	33	Yes
2	17	No
5	42	Do not know

Question 25:
Did the users add value?

No. of responses	%	Description
4	33	No
1	8	Not really, just a bit
7	59	Yes

Question 26:
Was the users' participation recognised?

No. of responses	%	Description
7	58	Yes
2	18	Do not know
1	8	No, do not think so

Question 27:
Were they allowed to give enough input?

No. of responses	%	Description
1	8	Plenty of time but they were not committed
2	17	No
1	8	More than enough
8	67	Yes

Question 28:
Was their input been taken seriously?

No. of responses	%	Description
1	8	No
1	8	Yes, the bit they did give
10	84	Yes

Question 29:
Were you satisfied with their involvement?

No. of responses	%	Description
1	8	No
1	8	Yes, but it was related to the commitment
2	17	Yes but needed more, not adequate users involved
8	67	Yes

Question 30:
Did you feel they needed to be more involved?

No. of responses	%	Description
3	25	Yes
9	75	No

Question 31:
Were the end results what they expected?

No. of responses	%	Description
2	17	Not totally
3	25	No
2	17	Think so
2	17	Yes and no
1	7	No, but we just need to sell it to them
2	17	Yes

Question 32:
Do they feel more confident using the end product by being involved?

No. of responses	%	Description
3	25	Think so
2	17	Could have been, but they were not involved enough
3	25	Do not know
3	25	Yes
1	8	Yes, some where just involved to late

Question 33:
Were they asked to give feedback on the end product?

No. of responses	%	Description
6	50	No
4	34	Do not know
1	8	Not explicit
1	8	Yes

Question 34:
How do you view your relationship with the users?

No. of responses	%	Description
2	17	Excellent
5	41	Good, it was a great team
3	25	No problems
2	17	Not initially good relationship, but it changed

APPENDIX C (1): A TRANSCRIPT EXAMPLE OF 1 USER INTERVIEW

Question will be presented and then the answer will follow:

Question 1: How would you describe a successful system? - Prompt (reliability, adaptability, user-friendly, availability, easy to use, easy to learn from scratch, measured to an SLA, response times, cost recovery after period of time, return on investment after period of time)
A successful system must be user friendly and the end-users must be able to use it with ease. The business needs must have been met. Reliability is very important. A definite need exists to be able to measure against an SLA. Response times are very important but it must be possible to be measurable against something. Cost recovery is essential.
Question 2: Keeping your previous answer in mind, do you view this project as resulting in a successful system?
No
Question 3: Who initiated the project? - Prompt (business/systems)
Business area.
Question 4: Who do you think should initiate projects? - Prompt (business /systems)
Business area. Although sometimes it is mandatory to initiate a project because of mandatory compliance regulations.
Question 5: Who supervised the project? - Prompt (business/systems)
Business area and systems area. From a business perspective, they know what it is they want out of the system. From a systems perspective, they assume they know what it is the business wants.
Question 6: If the other party would have supervised, could the results have been better?
Not Applicable

Question 7: In your opinion, where the right level of users involved?
Yes, it must be kept in mind that, for testing, a clerical user must be used and for the pre-definition information it should be a more managerial type of user.
Question 8: If not, who should have been involved, or should there have been more involvement?
Not applicable.
Question 9: Did you follow a phased approach?
Yes.
Question 10: Were there checks in place after each phase? (If applicable)
Yes, but these checks are not really used. They are only there for management and are often just given to satisfy the managers.
Question 11: How do you view the success of the phased approach? (If applicable)
It allows putting a structure in place. It should be clear to see the status of a project at any point in time. It enables the project to be more streamlined. Enables to look at smaller chunks of a project instead of the project as a whole, which is a difficult process.
Question 12: What parts of the life cycle where you involved in? - Prompt (requirement phase, feasibility study, system analysis and conceptual design, physical design and construction, testing, operation, maintenance, post audit.)
I was involved in the requirements phase, the feasibility study, the systems analysis phase and testing. No post audit for this project.
Question 13: How do you feel about being involved in the development life cycle?
I enjoyed it very much.
Question 14: Did it help being involved?
Yes.

Question 15: Did you have goals to achieve? What was expected from you? Prompt (provide business perception, JAD participation, involvement in Documentation, standards, testing, prototyping, screen/report/form design)
I was part of the project to provide business rules during the JAD sessions and to provide my business knowledge for this project. I was involved in writing the documentation. I was not involved in setting up of standards, the project used the general standards provided for the organisation. No prototyping was done for this project.
Question 16: Did you meet these goals?
I feel confident to say I have achieved my goals.
Question 17: If no goals specified, do you believe there should have been goals?
Not applicable
Question 18: Were you involved in testing? - Prompt (UAT, program testing, and what testing)
Yes, during systems testing and UAT.
Question 19: Did it help being involved?
Definitely.
Question 20: Who determined the test data?
The users.
Question 21: Who did the training?
The users.
Question 22: Who wrote the training manuals?
The users.

Question 23: Who wrote the operations manuals?
The system developers.
Question 24: Was it sufficient and covering everything?
We work more from the training manuals, so it is difficult to say.
Question 25: Did you feel you added value?
Yes.
Question 26: Was your participation recognised?
Yes.
Question 27: Were you allowed to give enough input?
Yes.
Question 28: Was your input taken seriously?
Yes.
Question 29: Did you feel you needed to be more involved?
Yes. Specif: ally some of the other users.
Question 30: Were you satisfied with your involvement?
No, sometimes one gets 'bogged-down' with normal operational work and to little time to be properly involved.
Question 31: Were the end results satisfactory and what you expected?
In some ways yes. There were some disappointments.

Question 32: Do you feel you have more confidence using the end product by being involved?
Yes.
Question 33: Were you asked to give feedback on the end product?
Not explicit.
Question 34: How do you view your relationship with the developers?
Very good. It depends on the team. Some teams are bad and I guess it is personality problems.
General:
There need to be a methodology in place. There need to be a structure. There need to be some sort of common goal during the project. Business users and system developers must be on same wavelength and timeframe and they must have common level of understanding. There need to be management underwriting for the project and it must be managed effectively. There need to be documentation and proper signoffs from the users at end of each phase.

APPENDIX C (2): A TRANSCRIPT EXAMPLE OF 1 SYSTEMS DEVELOPER INTERVIEW

Question will be presented and then the answer will follow:

Question 1: How would you describe a successful system? - Prompt (reliability, adaptability, user-friendly, availability, easy to use, easy to learn from scratch, measured to an SLA, response times, cost recovery after period of time, return on investment after period of time)
It must be what the users wanted. It must be very reliable because false accusations might exist and it will leave a bad taste and it can provide tremendous problems. It should be fairly adaptable. It must be very user-friendly in the sense that the user should be able to page through easily, it should not be necessarily spoon-fed friendly. The system must be available 6 days a week between 7:00 am and 10:00 PM. It must be very easy to use. I don't think a SLA is required. Response times must be good, the users always have a client on the phone. Cost recovery is very important, in this systems case, the system will definitely recover costs since the paper version is very time consuming.
Question 2: Keeping your previous answer in mind, do you view this project as resulting in a successful system?
No
Question 3: Who initiated the project? - Prompt (business/systems)
The user area initiated the project
Question 4: Who do you think should initiate projects? - Prompt (business /systems)
The business area. They should buy into it specifically for a new project, they must be happy with the outcome and they are in the end the users of the systems.
Question 5: Who supervised the project? - Prompt (business/systems)
The supervision was a combination effort. Sometimes it was difficult to determine who really is supervising. The systems area organised the project and the business area dictated.

Question 6: If the other party would have supervised, could the results have been better?
Supervision should be from both sides. The responsibilities should just be more clearly defined up-front for both the users and the system developers.
Question 7: In your opinion, did you have the right level of users involved?
Yes, there where users involved from all relevant levels.
Question 8: If not, who should have been involved, or should there have been more involvement?
Not applicable
Question 9: Did you follow a phased approach?
Yes.
Question 10: Were there checks in place after each phase? (If applicable)
Yes, sign-offs where required by the systems area from the business area.
Question 11: How do you view the success of the phased approach? (If applicable)
It always helps tremendously.
Question 12: What parts of the life cycle where the users involved in? - Prompt (requirement phase, feasibility study, system analysis and conceptual design, physical design and construction, testing, operation, maintenance, post audit.)
The users where involved in the requirements phase, the feasibility study and during the analysis phase. No, the users where not involved during the conceptual design or physical design and construction. They where involved during testing. During operation they will naturally be involved, most maintenance requests come directly from them. No the users where not involved during the post-audit.
Question 13: How do you feel about involving users in development life cycle?
It is a given but it must be the right choice of users.

Question 14: Did it help involving the users? - Prompt (ability to validate at end of each phase (described above), where you more satisfied with end result)
It did help involving the users, they where able to give input, verify the interpretation and the correctness of the interpretation and also where they able to check the end results. It definitely made a difference to the end result and it was more satisfactory.
Question 15: In your opinion, did they have goals to achieve? What was expected from them? Prompt (provide business perception, JAD participation, involvement in documentation, standards, testing, prototyping, screen/report/form design.)
The users only had to provide their opinions, tell us what they wanted and made sure that this happened. They also had to provide examples of requirements if the expectations where unclear. As mentioned earlier, more should have been emphasised during the documentation phase. No prototyping was done during this project.
Question 16: In your opinion, did they meet these goals?
What we needed from them, I feel we got. Sometimes it could have been more timeous, but we where able to make up for that lost time.
Question 17: In your opinion, if no goals specified, do you believe there should have been goals?
It could have been more specific.
Question 18: Were they involved in testing? - Prompt (UAT, program testing, and what testing)
They where only involved during the user acceptance testing.
Question 19: Did it help involving them?
Most definitely. It is difficult to supply all versions of test data without the help of the users. It also provided a 'sort of' initial training.
Question 20: Who determined the test data?
Mainly the system developers, but during User acceptance testing, the users also determined some test data.

Question 21: Who did the training?
The system developers did the little bit that was done.
Question 22: Who wrote the training manuals?
The system developers, although, to my standards, this was not sufficient.
Question 23: Who wrote the operations manuals?
System developers.
Question 24: In your opinion, was it sufficient and covering everything?
No it was surely not sufficient, and an attempt was made to cover everything, but no, it did not cover everything.
Question 25: Did the users add value?
Absolutely.
Question 26: Was the users' participation recognised?
Yes.
Question 27: Were they allowed to give enough input?
From my viewpoint, yes.
Question 28: Was their input been taken seriously?
Yes, at all times.
Question 29: Were you satisfied with their involvement?
Yes.

Question 30: Did you feel they needed to be more involved?
I believe they needed to be more involved during the writing of the user manuals, setting up of standards and even during the design phase. During the design phase only for explaining of uncertainties.
Question 31: Were the end results what they expected?
The comments and complaints afterwards did not imply this.
Question 32: Do they feel more confident using the end product by being involved?
With all complains taken into account, yes, I think they did feel more confident.
Question 33: Were they asked to give feedback on the end product?
Not directly, but indirectly feedback was given.
Question 34: How do you view your relationship with the users?
They are very nice people, even with the few 'misunderstandings' that occurred during the project lifecycle, we get along well.
General:
It is extremely important to follow a proper methodology and always keep the users in mind. A proper communication must be in place between the system developers and the users. There always exists a fine line between users needs and user 'nice to haves'. This should be considered at all times and compromises must be made with all sorts of variables in mind. Biggest problem today is communication. Another important factor for the success of a system is the design and level and competency of involvement from both users and system developers' side.

Author Morrison M
Name of thesis The Role Of User Involvement In The Success, Or Otherwise Of Systems Development Within A Major Bank In South Africa Morrison M 1998

PUBLISHER:
University of the Witwatersrand, Johannesburg
©2013

LEGAL NOTICES:

Copyright Notice: All materials on the University of the Witwatersrand, Johannesburg Library website are protected by South African copyright law and may not be distributed, transmitted, displayed, or otherwise published in any format, without the prior written permission of the copyright owner.

Disclaimer and Terms of Use: Provided that you maintain all copyright and other notices contained therein, you may download material (one machine readable copy and one print copy per page) for your personal and/or educational non-commercial use only.

The University of the Witwatersrand, Johannesburg, is not responsible for any errors or omissions and excludes any and all liability for any errors in or omissions from the information on the Library website.