

**M-COMMERCE: STANDARD BANK'S CELLPHONE BANKING ADOPTION
BY CUSTOMERS**

By

**ZANELE DAWN MTHETHWA
201509818**

Submitted in partial fulfilment of the requirements for the degree of **MASTERS
OF BUSINESS ADMINISTRATION**

Graduate School of Business
University of Kwazulu Natal

Supervisor: Professor Elza Thomson

October 2004

31 August 2004

TO WHOM IT MAY CONCERN

RE: CONFIDENTIALITY CLAUSE

Due to the strategic importance of this research it would be appreciated if the contents remain confidential and not circulated for a period of five years.

Sincerely

Z. D. Mthethwa

DECLARATION

This research has not been previously accepted for any degree and is not being currently in candidature for any degree.

Signed:

Date:

096939

ACKNOWLEDGEMENTS

My employer, Standard Bank, is gratefully acknowledged for approving and sponsoring me to study for the Masters in Business Administration at the University of Kwazulu Natal.

I am grateful to my research supervisor, Professor Elza Thomson at the University of Kwazulu Natal for providing much needed guidance and support. Her thoughtfulness is greatly appreciated.

My husband, Collin, made enormous sacrifices in order for me to undertake the study and his emotional support and encouragement was bountiful.

ABSTRACT

Mobile commerce is a product of the convergence of the two fastest growing technologies of the modern era: cellular phones and the Internet (Attwood and Duncan, 2000). It delivers electronic commerce capabilities into a consumer's hand via wireless technology, that is an ability to perform a transaction using a mobile device (cellphone, laptop, PDA), such as the cellphone banking service. The cellphone banking service allows banking customers to perform banking transactions directly on their cellphone, using either WAP or WIG technology. Four big banks in South Africa provide the cellphone banking offering to customers. Nedcor first launch the cellphone banking service and other banks followed. Standard Bank launched the service in 2001 and thus far only 28 000 customers have registered for the cellphone banking service.

The level of service adoption is very low, considering that there are 15million cellphone subscribers in South Africa. Banks projected that the take-up would be much higher than it currently is. For the purpose of this research study, the Standard Bank's cellphone banking offering will be evaluated. The problem area is that while Standard Bank launched the cellphone banking service in 2001, the consumer take up has been far lower than expected. Thus far, only 28 000 customers have registered for the service. No analysis has been conducted at Standard Bank to understand the reasons behind the slow rate of adoption by customers.

The objectives of the study are to:

- identify the factors that contribute to the non-adoption of the cellphone banking service by customers
- identify factors that can increase the rate of service adoption and therefore assist the banks in promoting the service to critical mass
- Establish the future of m-commerce in the banking industry.

A literature review has been conducted, where studies conducted internationally in mobile banking space have been discussed. These are studies conducted in Europe and the United States. The cellphone banking adoption framework model has also been derived. In terms of the research methodology, qualitative and quantitative research methods were both employed to gather the required data. For the qualitative methodology, interviews were conducted with the Standard Bank management team and a questionnaire was administered. For the quantitative methodology a questionnaire was designed and was used to gather the information from Standard Bank customers.

The research results reveal that cellphone banking has not been widely adopted, despite the rapid diffusion of cellphones in South Africa and the popularity of cellphone functionality such as SMS. Factors likely to influence adoption include trialability, relative advantage, and the customer need for banking services from a cellphone and lower perceptions of technology risk.

TABLE OF CONTENTS

	PAGE
CHAPTER 1: RESEARCH INTRODUCTION	1
1.1 Introduction.....	1
1.2 Research background	1
1.3 Company background.....	3
1.4 Motivation for undertaking this study	5
1.5 Value of the study to the organisation.....	5
1.6 Problem statement.....	6
1.7 Research objectives.....	6
1.8 Research design and methodology.....	6
1.9 Prior Assumptions.....	10
1.10 Limitations.....	10
1.11 Layout of the research report.....	10
1.12 Conclusion.....	12
CHAPTER 2: M-COMMERCE LITERATURE REVIEW	13
2.1 Introduction.....	13
2.2 M-Commerce Overview.....	13
2.3 The South African Market Place M-Commerce Offerings	20
2.4 Cellphone Banking Service.....	21
2.5 Is Cellphone Banking The Way Forward?.....	23
2.6. Mobile Banking In Europe.....	24
2.7 Mobile Banking Participants.....	33
2.8 Perception Of Mobile Financial Services In Europe.....	44
2.9 Who's Banking On Cellular Phone?.....	50
2.10 Wireless Retail Banking Adoption In The United States.....	51
2.11 Factors Influencing Non-Adoption Of M-Commerce.....	53
2.12 Bridging Strategies Revive Wireless Finance.....	54
2.13 Technology Adoption Life Cycle.....	57
2.14 M-Commerce Adoption Framework.....	58
2.15 Conclusion.....	60

CHAPTER 3: RESEARCH METHODOLOGY 61

3.1 Introduction.....61
3.2 Quantity Research Methodology.....61
3.2.1 Sampling.....61
3.2.2 Data Collection Method.....64
3.2.3 Research Questionnaire Design.....64
3.2.4 Pilot Study.....65
3.3 Statistical Methods.....66
3.3.1. Descriptive Statistics.....66
3.3.2 Inferential Statistics.....67
3.3.3 Constructs Reliability.....68
3.3.4 Constructs Validity.....68
3.4 Qualitative Research Methodology.....69
3.5 Conclusion.....69

CHAPTER 4: REPORTING AND DISCUSSION OF RESULTS 71

4.1 Introduction.....71
4.2 Quantitative Research Methodology.....71
4.2.1 Descriptive Statistical Results.....71
4.2.2 Inferential Statistical Results.....75
4.2.2.1 Frequency Analysis.....75
4.2.2.2 Correlation Analysis.....79
4.3 Qualitative Research Methodology.....79
4.4 Conclusion.....82

CHAPTER 5: CONCLUSIONS AND RECCOMMENDATIONS 83

5.1 Introduction.....83
5.2 Outcomes of the Research.....83
5.3 Recommendations.....85
5.4 Summary.....86

REFERENCES.....88

BIBLIOGRAPHY.....90

APPENDICES

GLOSSARY.....91

RESEARCH QUESTIONNAIRE.....92

CORRELATIONS.....97

LIST OF FIGURES

Figure 1.1 Cellphone Banking Registrations.....3
Figure 2.1 M-commerce value chain.....16
Figure 2.2 Wireless communication structure.....21
Figure 2.3 Expected demand for mobile financial services in the future.....45
Figure 2.4 Features of practical and successful mobile financial services...46
Figure 2.5 Barriers to success for mobile financial services.....47
Figure 2.6 Successful strategies for the future.....49
Figure 2.7 Weighing in on the retail wireless banking services.....52
Figure 4.1 Perceived Risk of cellphone Banking.....74
Figure 4.2 Cellphone Banking Relative Advantage.....75
Figure 4.3 Diversity of Banking Services.....76

LIST OF TABLES

Table 1.1 Cellular Phones Subscriptions.....2
Table 1.2 M-commerce Competitive Analysis.....4
Table 2.1 Cellphone users and consumers.....15
Table 2.2 S. A. M-commerce offerings.....20

Table 2.3 How popular will mobile financial services be in the future?.....	45
Table 2.4 M-Commerce comfort levels of the U.S. consumers.....	53
Table 3.1 Respondents' demographic profile.....	63
Table 4.1 Descriptive Statistical Results.....	72
Table 4.2 Cellphones ownership vs. Cellphone Banking Usage.....	72
Table 4.3 Banking Frequency vs. Banking Channel Used.....	73
Table 4.4 Cellphone Banking Trialability.....	77

Chapter 1: Research Introduction

1.1. Introduction

Cellphone usage has grown phenomenally in Africa, and particularly in South Africa, where initial growth forecasts have been greatly exceeded. This technology provides opportunities for services such as banking to reach critical mass. All major retail banks in South Africa offer M-commerce services, mainly cellphone banking, but very few customers actually use this service. This study will examine the adoption of cellphone banking by banking customers and the factors likely to increase the customers' adoption rate. Recommendations will be made as to whether Standard Bank should continue to invest in the M-commerce technology.

1.2 Research Background

Recent statistics indicate that, by January 2004, the cellphone market size in South Africa had reached 15 million subscribers, and is currently still growing rapidly (Icon Cellular Landscape analysis, 2004). There is strong competition in cellphone network provision, with Vodacom dominating the market with 51 percent of total subscriptions, then followed by MTN with 38 percent total subscriptions and the third recent entrant, Cell C, gradually gaining a market share with eleven percent. According to the Icon Cellular Landscape Analysis (2004) in Table 1.1 the prepaid subscriptions are growing at a high rate as compared to the postpaid subscriptions. There are 12-million prepaid subscribers and only two million postpaid subscribers in South Africa. These figures are in contrast to the slower growth in the fixed line telephone network, where there is currently only one national provider (Telkom) and about five million fixed telephone line subscribers (ITU, 2003). Thus, there are three times as many cellphone subscribers and this is despite the fact that cellphone services were only introduced in South Africa in 1994.

Table 1.1 Cellular phones subscriptions

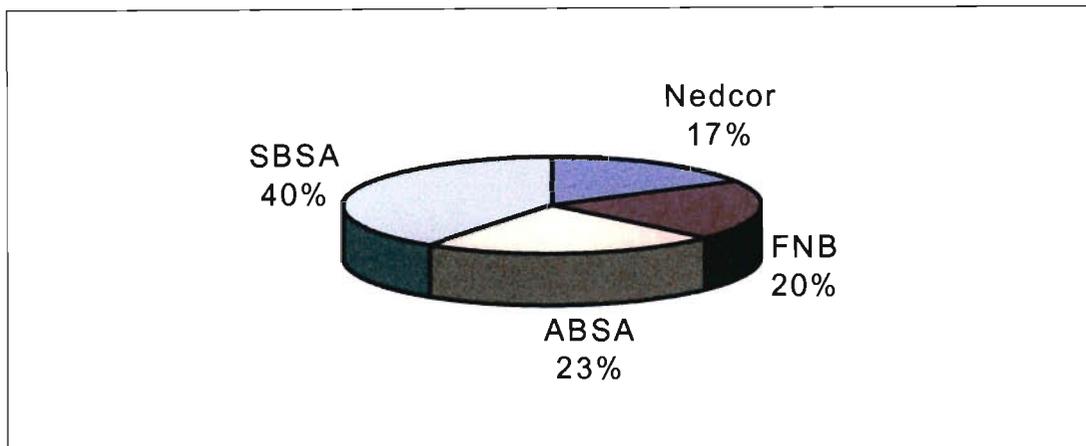
	MTN	%	V'Com	%	Cell C	%	Total	%
Total subs (000)	5,336	38%	7,259	51%	2,514	11%	15,109	100%
Prepaid subs	4,288	37%	6,012	52%	2,354	12%	12,654	100%
Postpaid subs	1,048	43%	1,247	51%	180	7%	2,455	100%

Source: Icon Cellular Landscape analysis, 2004: 6

Mindful of these figures about cellular phones subscriptions, four major retail banks in South Africa (namely Standard Bank, First National Bank, Nedbank and ABSA) have all developed and launched the M-commerce solutions, mainly providing cellphone banking services to customers. Nedbank is the first bank to launch the service in the market. For the purpose of this study, the Standard Bank's Cellphone Banking customer adoption rate will be evaluated.

Standard Bank's Cellphone banking usage is very low, as the bank only implemented the cellphone banking service in 2001 and by January 2004 only 48 000 customers have registered for the service. This trend is similar to that of other major banks in South Africa. The Cellular Online (2004), in Figure 1.1 article indicates that Standard Bank lead the cellphone banking registrations by forty-percent marketsahre and the others banks following behind. Standard Bank may be the leader but the customer base is very small, which the bank is struggling to increase the service adoption to the 12-million personal customer base it currently has.

Figure: 1.1. Cellphone Banking Registrations



Source: Cellular online, 2004: 20

It is thus opportune to conduct an exploratory study to analyse the cellphone banking service offered by Standard Bank by examining the factors that contribute to its slow adoption and as well the factors that would influence the adoption of cellphone banking. This would then give an idea of how such an innovation could be marketed in order to achieve critical mass. Such a goal is important in South Africa, as a large proportion of the population remains “unbanked” and cellphones may present opportunities for reaching such people. One of Standard Bank’s objectives to be able to provide banking services to the masses in South Africa and many people have cellular phones. This is seen as means to provide banking to rest of the population that did not have access to banking before.

1.3 Company Background

Rooted in Africa and with strategic representation in key sub-Saharan markets, Standard Bank is a regional banking force with a global reach. The holding company is based in Johannesburg, South Africa, and is listed on the Johannesburg Securities Exchange as Standard Bank Group Limited.

Standard Bank delivers services through more than 1100 points of representation throughout South Africa. The company network spans 17 other

sub-Saharan countries and extends to 20 countries on other continents, including the key financial centres of Europe, the United States and Asia.

Standard Bank has established itself as a leader in banking technology for both personal and business markets in South Africa. Standard Bank launched their cellphone banking service in 2001 to the personal market. Since then the bank has introduced other innovative ways for customers to utilise their cellphones for banking purposes.

1.3.1 Standard Bank’s M-commerce SWOT Analysis:

Financial services companies in South Africa developed M-commerce strategies that will give them direction when adopting M-commerce in their environment. A SWOT analysis of an organisation is a useful way of summarising the current status of an organisation (Lynch, 2000). Standard Bank’s m-commerce SWOT analysis is detailed in Table 1.2.

Table 1.2 M-commerce Competitive Analysis

Strengths	Weaknesses
<ul style="list-style-type: none"> • Currently exploring various opportunities • TR&D • IT development skills • Existing service / applications 	<ul style="list-style-type: none"> • System Infrastructure • Lack of executive 'support' • Device and channel agnostic • No marketing
Opportunities	Threats
<ul style="list-style-type: none"> • BtoE • BtoB • Maturing technologies • Competitive advantage • New revenue streams • Increased market share • Move from banking transactions to payment facilitator 	<ul style="list-style-type: none"> • Non financial entrants • Disintermediation by non-financial institutions • Networks acquiring payments becoming a bank • Other banks identifying similar opportunities • Trust

Source: Standard Bank M-Commerce Report, 2003: 23

The cellphone banking service provides opportunities for Standard Bank to compete with the other banks. A proper focus to the service is required, such as the design of the system infrastructure, the executive management buy-in and the marketing of the service. Standard Bank has to capitalise on its strengths so as to succeed with the M-commerce offering.

1.4 Motivation for undertaking this study

Given the interest around M-commerce, especially cellphone banking, the rapid pace at which the technology is evolving, it is considered worthwhile to analyse the factors contributing to its non-adoption by consumers and the factors that can increase its adoption. The growth of cellphones usage in South Africa has been phenomenal, with more than one in four South African subscribing to a cellphone service provider. This is in contrast to Internet users, who represent one in fifteen South Africans. Cellphones therefore, offer great opportunities for services such as banking to reach critical mass, as compared to other options such as the Internet and land-line telephone.

Standard Bank has invested a great deal of money and time in the M-commerce technology and the customer take-up of cellphone banking is less than expected. This study will focus on establishing the reasons for this low rate of adoption and factors likely to contribute to the increase in the service take-up by customers.

1.5 Value of the study to the Organisation

Due to the investment that Standard Bank has made towards the M-commerce (cellphone banking) offering, it is imperative for the bank to establish the factors behind the service non-adoption by customers. Establishing the factors that can contribute to the adoption of M-commerce services will assist the bank in marketing the channel better. The bank will be able to recoup returns on this investment. This information will enable Standard Bank to make an informed decision as to how to take the offering to market and to promote the critical mass adoption.

1.6 Problem Statement

Standard Bank launched the cellphone banking service 2001 and thus far the rate of service adoption by customers has been extremely slow. Standard Bank is struggling to convince customers to use the cellphone banking service to conduct banking transactions. Even though the current cellular phones subscriber base is 15m, the take-up of M-commerce banking services in South Africa is low, at approximately 90 000 customers. Standard Bank accounts for approximately 40% of the market, as represented by 48 000 registered customers.

Why are the consumers not adopting the Standard Bank's cellphone banking offering?

1.7 Research Objectives

The desired end result for this proposed study is as follows:

- To evaluate the non- adoption of cellphone banking offering by consumers
- To determine factors likely to increase the adoption of the cellphone banking offering
- To establish the Standard Bank's M-commerce future plans.

1.8 Research Design and Methodology

An exploratory study will be conducted, incorporating both qualitative and quantitative techniques, which will be applicable. Qualitative research refers to the meaning, the definition or analogy or model or metaphor characterising something, while quantitative research assumes the meaning and refers the measure of it (Cooper and Schindler, 2003:23).

For qualitative study, interviews will be conducted. The participants will consist of Standard Bank's M-commerce management team, which comprises those who were involved in the launch of cellphone banking and those who manage the service within Standard Bank.

The quantitative section of the study will consist of the several aspects.

□ **Sampling**

The sample population of the study will be any Standard Bank customer who uses or is familiar with cellphones and as well as banking facilities. The potential population is five million Standard Bank customers. However, not all of them will be cellphone subscribers. Given that an exploratory study is proposed, a convenience sampling will be employed.

□ **Data collection methods**

A questionnaire will be designed for the purpose of gathering the data for the analysis. Data will be primarily gathered by visiting bank branches, where banking customers are to be found and where it is likely that they will also have a cellular phone.

□ **Analysis and interpretation of data.**

Data analysis consists of conducting a statistical analysis of the data collected. Descriptive and inferential statistical procedures will be employed. Descriptive procedure is used to describe distributions, while inferential procedures are used for hypothesis testing.

□ **Hypotheses**

A hypothesis is described as a statement in which variables are assigned to a case (Cooper and Emory, 1999). It is also when a proposition is formulated for empirical testing. The role of the hypothesis in the research study is to:

- Guide the direction of the study
- Identify facts which are relevant and those that are not
- Suggest which form of research design is likely to be appropriate
- Provide a framework for organising the resulting conclusions.

The hypotheses formulated are presented below.

(a) Hypothesis 1: Relative Advantage

Agarwal and Prasad (1997) demonstrate that the advantage of an innovation relative to another influences its rate of adoption. It is therefore possible to suggest that the advantages that cellphone banking offers over other banking methods would affect its rate of adoption. Hence the hypothesis is as follows:

H1: The greater the perceived Relative Advantage of using cellphone banking, the more likely it is to be adopted.

(b) Hypothesis 2: Perceived Complexity

The size of a cellphone makes working with it difficult and frustrating for some people, and so using a cellphone for banking transactions may be perceived as complex. Consequently, the adoption of mobile commerce is likely to be negatively affected, thus the following hypothesis:

H2: The higher the perceived complexity of using cellphone banking, the less likely it is to be adopted.

(c) Hypothesis 3: Trialability

Potential adopters of a new technology who are allowed to experiment first will feel comfortable with it and thus be more likely to adopt it (Agarwal & Prasad 1997, Tan & Teo 2000). Thus the adoption of mobile commerce is

more likely if the technology is demonstrated to the user or if it can be used on a trial basis first:

H3: The greater the Trialability relative to mobile commerce the more likely it is to be adopted.

(d) Hypothesis 4: Cellphone Experience

Tan and Teo (2000) showed that the greater the Internet experience of an individual, the more likely it was that Internet banking would be adopted. In terms of mobile commerce, it follows therefore that those with great cellphone experience are more likely to use cellphone banking. Given the simplicity of using a cellphone for making and receiving calls, however, it is anticipated that the type of experience most likely to influence the adoption of mobile commerce, are the more sophisticated uses, such as sending text messages (SMSs), performing calculations, and the playing of games. Thus the hypothesis is:

H4: The greater the diversity of cellphone experience, the more likely it is that mobile commerce will be adopted.

(e) Hypothesis 5: Banking needs

As with Internet commerce adoption, it is expected that those who require a wide variety of banking products and services are more likely to want to adopt innovations such as mobile commerce. Thus the hypothesis is:

H5: The greater the diversity of banking services and products required, the more likely it is that mobile commerce will be adopted.

(f) Hypothesis 6: Perceived Risk

One of the major influencing factors around the establishment and use of new technologies for financial transactions is that of security and trust (Mc Knight

et al., 2002). The need for security for personal details and financial information is therefore critical to the success of mobile commerce. As a result, the lower the perception of risk involved in using mobile commerce, the more likely it is adopted.

H6: The greater the perceived risk of using mobile commerce, the less likely that it is adopted.

1.9 Prior Assumptions

It was assumed that mobile commerce technology is a technology similar to electronic commerce technology.

1.10 Limitations

The study will be restricted to Standard Bank and will therefore exclude conducting the research with customers from the other three big banks: ABSA, Nedcor and FNB. Only Standard Bank customers will be approached to participate in the research.

Customers' unwillingness to participate in the study is possible, due to lack of knowledge of the M-commerce subject.

1.11 Layout of the research report

The research report will comprise the following sections.

Chapter 1: Introduction and background

- The research introduction

Chapter 2: Review of current literature

- the importance of the M-commerce area of research will be discussed

- the current status of the topic will be discussed. The non-adoption of cellphone banking and its implication to m-commerce
- the relationship between the literature and the problem statement will be included in the research
- hypotheses will be formulated.
- summary of the literature review.

Chapter 3: Research methodology

The research methodology will be derived and discussed.

- research design
- identifying data required for the study
- data collection plans and procedure – interviews and a questionnaire
- operational definition of all variables brought to the study
- validity and reliability of instruments will be discussed.
- proposed analysis of data.

Chapter 4: Results of study

Research findings will be presented and discussed and will include the following:

- Results of data.

Chapter 5: Conclusion and discussion

This chapter will consist of the research conclusion.

- discussion of implications, recommendations and limitations.
- discussion of future research.
- research conclusion.

1.12 Conclusion

Mobile banking applications bring banking closer to customers, and allow them to develop self-service procedures giving greater control over how, where and when they can carry out their banking transactions. For Standard Bank there are immediate reasons to get involved in M-commerce. The short-term motivation is a defense measure to prevent mobile network operators from leveraging their close relationship with mobile customers into a full banking service. Cellphone banking also allow the bank to add an extra distribution channel to reach customers and offers cost savings by providing a cheaper alternative than the current investments in a physical branch network. The cellphone banking adoption framework has been derived and the hypotheses to be tested were formulated.

A literature review encompassing the M-commerce and the cellphone banking service will be discussed in detail in the next chapter.

Chapter 2: M-commerce Literature Review

2.1 Introduction

This chapter of the study will identify previous literature studies that were conducted in the sphere of M-commerce. Firstly, definitions of m-commerce will be listed to lay a foundation of what m-commerce is. M-commerce offerings in South Africa will be covered next. The Cellphone Banking service will be described as the main focus of the research in this study, i.e. the m-commerce service offered in the banking industry. Cellphone/mobile banking studies conducted in other countries will be presented. The technology adoption life cycle will be presented and this is to be used to produce the M-commerce adoption framework.

2.2 M-commerce Overview

Mobile Commerce is the delivery of electronic commerce capabilities into the customer's hand via wireless technology. Mobile Commerce (M-commerce) is the product of the convergence of the two fastest growing technologies of the modern era: cellphones and the Internet (Attwood and Duncan, 2000:47). Much excitement has been generated about the potential of the industry, and cellular phones operators have paid substantial amounts to participate in the M-commerce industry: third-generation (3G) mobile license auctions raised \$ 34 billion in the UK and \$45.9 billion in Germany (Financial Times, 2000c). The risk for cellular operators is high: they will only recover their investments if they choose their position in the industry well and M-commerce is enthusiastically adopted by consumers (Levin and Wolfenden, 1999:62).

The Global Mobile Commerce Forum (GMCF) defines M-commerce as "the delivery of electronic commerce capabilities to consumers via wireless technology" (Attwood and Duncan, 2000:24).

This definition can be broken down into two areas:

- Wireless technology enables communication to the handheld electronic devices without the use of fixed networks. Thus, as indicated in Circle 1, Figure 2.2, such devices include cellular phone, notebook computers and other mobile devices such as personal digital assistants (PDAs) (Scientific American, 2000). Transactions conducted using a dial-up connection over a fixed network are not regarded as being within the ambit of M-commerce even if a notebook or PDA, for example were to be used. To date the focus has been placed on cellular phones, but companies are now beginning to place greater emphasis on the use of other wireless devices to access the Internet. For example, NTT DoCoMo, a Japanese mobile operator which has enjoyed substantial success with M-commerce, signed an alliance with Palm, manufacturer of handheld devices, to encourage the use of handheld devices for accessing the Internet (Nakamoto, 2001).
- In terms of GMCF's definition and the fact that M-commerce is an alternative channel for conducting business (The Banker, 1999), it can be regarded as a branch of e-commerce (Internet 1, 2002). E-commerce is the use of electronic networks – including the Internet for buying and selling goods and services (Laudon and Laudon, 1997). Indeed M-commerce is defined as means to access the Internet from hand-held devices (Convergence, 2000). Thus, mobile commerce is any transaction with a monetary value that is conducted via a mobile telecommunications network. M-commerce transactions can take place without networks (Attwood and Duncan, 2000).

2.2.1 Cellular phones usage

Cellphones usage worldwide is set out in the table 2.1.

Table 2.1: Cellphone users and consumers

Region	Mobile Users	Mobile consumers
Africa	4,900,001	1,650,00
Asia-Pacific	206,500,000	131,750,000
Europe	68,850,000	39,350,000
Central/ South America	18,250,000	11,850,000
North America	133,290,000	86,790,000
Australia	5,250,000	3,100,000
Former USSR	11,191,500	3,100,000
World	448,321,500	282,681,500

Source: Research portal.com, via Cyber Atlas

The cellular phones usage worldwide accounts for four hundred billion and mobile consumers are only fifty percent of that total. This shows that the adoption of the M-commerce solutions is still low worldwide. Asia-pacific is setting the trend for the other countries by being a leader in the usage of M-commerce solutions.

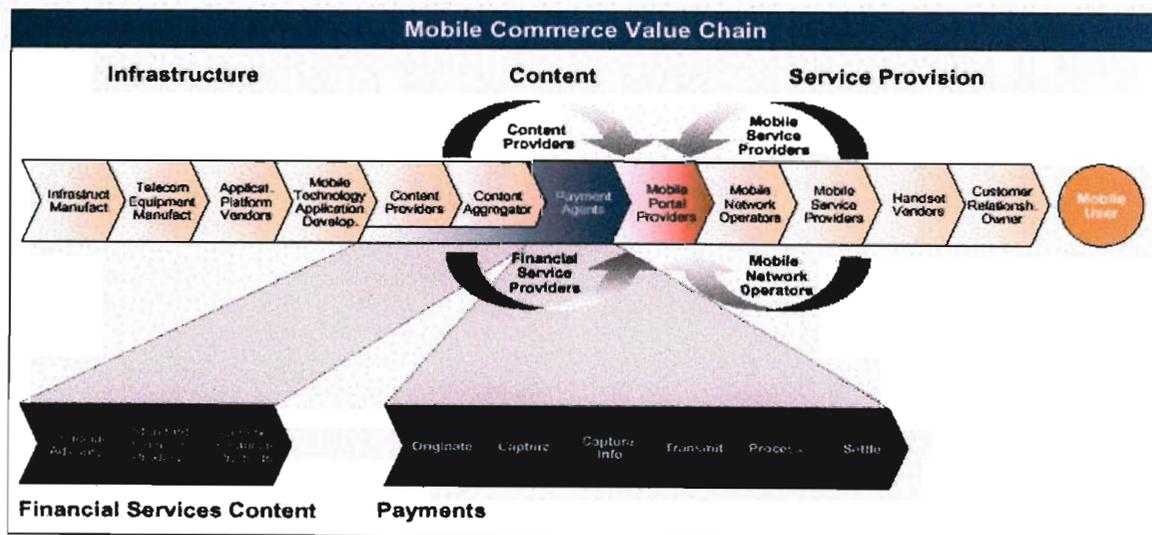
2.2.2 M-commerce Value Chain

The value chain identifies the primary activities that create value to customers and related support activities. The M-commerce value chain is detailed in figure 2.1.

The M-commerce value chain consists of the infrastructure, content and service provision. The infrastructure stakeholders are the telecom equipment manufactures, application platform vendors and the mobile technology application developers. These structures provide the M-commerce technology utilised by the service providers. Service provisions are the Mobile Service

Providers and Mobile Network Operators, such as Vodacom Service Provider and Vodacom Network Operator. These areas provide the cellular phone subscription to the customer, either prepaid or postpaid. Content providers are structures such as banks were services such as the cellphone banking are offered to banking customers. An agreement is entered into between a bank and a Mobile Network Operator to design a cellphone banking solution to be utilised by customers to perform their banking.

Figure 2.1 Mobile Commerce value chain



Source: IBM UBG

Source: IBM UBG, 2001:17

According to Black (in IBM UBG, 2001) there are certain imperatives of the mobile commerce applications to customers, which are due to its unique characteristics.

□ **Portable**

The device is nearly always with the user. The application can be used across wide range of mobile devices and the different circumstances in which they are used.

□ **Personal**

The device belongs to the user and will increasingly do so in the same way, in which a wallet is specific to an individual. It is of specific relevance to the user.

□ ***Positional***

Applications are offered on a GSM network, which nearly all cellphone users will be on, the geographic location of the device, and hence the users are both known.

□ ***Dual purpose device***

Handsets handle data traffic as well as voice traffic. Therefore a cellphone device can perform multiple actions.

2.2.3 M-commerce PESTLE Analysis

M-commerce is the technology utilised globally and it provides a global reach to users. The M-commerce PESTLE analysis should cover the technology, social, legal, economic, political and environment components.

□ **Technology**

According to Lynch (2000: 110) the following items could be analysed – State investment policy, research initiatives, patents and products, adoption of new technology, expenditure on research and development and developments in nominally unrelated industries that might be applicable. M-commerce provides an inexorable march of convergence on technologies: voice, data and video. As well as devices and TCP-IP. Lowering dollar costs increases the cellphones usage, as there is a higher consumer adoption rate. Handset manufacturer growth rates have stagnated for the past two years.

□ **Social**

In assessing the social environment one should consider factors such as, the shift in value systems, change in lifestyle, attitude towards work and leisure, environmental issues, education demographic changes and distribution of income (Lynch, 2000: 110). Mobile commerce offers a raised willingness to self-service via direct delivery and also increases the sophistication of the customer base. M-commerce offers rising access to the Internet and smart

networked devices. There is continuous concern about the security of the devices for conducting banking. There is a slow down in the rate of growth of adoption and the usage of cellphones and Internet. A reduction in ARPU (Average Revenue Per User) is being experienced. There is an increase of adoption rates of cellular phones in unsophisticated market segments (Internet 2, 2001).

□ **Legal**

Legal challenges to existing banking business models in Australia and USA with Card Associations will keep margins under pressure. The cellular phones industry is an increasingly legislated environment, in the form of the Electronic Communication and Transactions Act. Vague legislation will require testing via challenge and precedent settings. There is increasing pressure on banks to maintain high integrity systems and to carry the burden of proof in disputes with customers.

□ **Economic**

Increasing Rand-Dollar exchange rates make capital investments of first world technology far easier to justify and it also promotes greater use of local skills, therefore greater co-operation and sharing of resources will be possible. Limits to reducing cost to income ratio will require much greater migration to self-service banking channels.

□ **Political**

The greatest uncontrollable factor is the political environment. People and business within a country have to abide by the law or face prosecution. Arbee and Naidu (2001:56) point out that the political environment is characterised by the laws that govern a country. Laws are there to regulate society and in so doing relate business. In South Africa government action is needed to regulate the M-commerce offerings. There is an increasing demand for mass market delivery; greater pricing transparency; continuous reductions in bank

changes and creation of opportunities for smaller emerging banking players. There is a political pressure to reduce telecommunication charges in order to benefit direct distribution. There are also greater regulatory compliance challenges.

□ **Environmental**

The business environment in South Africa will continue to be typified by the flat to marginal growth; high interest rates versus the first world economies and the weak currency. There is an increasing opening up of the economy, but this is accompanied by an increased exposure to fraud and identity theft risks with the associated increase of reputational risk and the propensity to adopt direct channels.

These environmental are important, as they influence the utilisation of the M-commerce technology and the offerings of the M-commerce services in South Africa and globally. The M-commerce offerings in South Africa are detailed in Table 2.2, in the next section

2.3 The South African market place M-commerce Offerings

The M-commerce offering in South Africa comprise the following:

Table 2.2: S. A. M-commerce offerings

Nedcor	<p>WAP:</p> <ul style="list-style-type: none"> - Balances - Transfers - Account payments - Mini Statement
ABSA	<p>WIG (MTN)</p> <ul style="list-style-type: none"> - Balance Enquiry - Transfers - Mini statement - Payments
FNB	<p>WAP and WIG</p> <ul style="list-style-type: none"> - Balances - Account Information - Mini statement - Transfers - Payments - Change PIN
Standard Bank	<p>WAP and WIG:</p> <ul style="list-style-type: none"> - Balances - Transfers - Account payments - Mini Statement - Change PIN
Other	<ul style="list-style-type: none"> - MTN ICE – Alert service - MTN Mycall – dial-up for specific information - WAPHome – Alert and tracking service - ITouch – Alert Service on WAP and SMS platform - Vodacom Alerts – Alerts and tracking service - MTN Onecall – e-mail sent to cellular phone - MTN MobileCredit

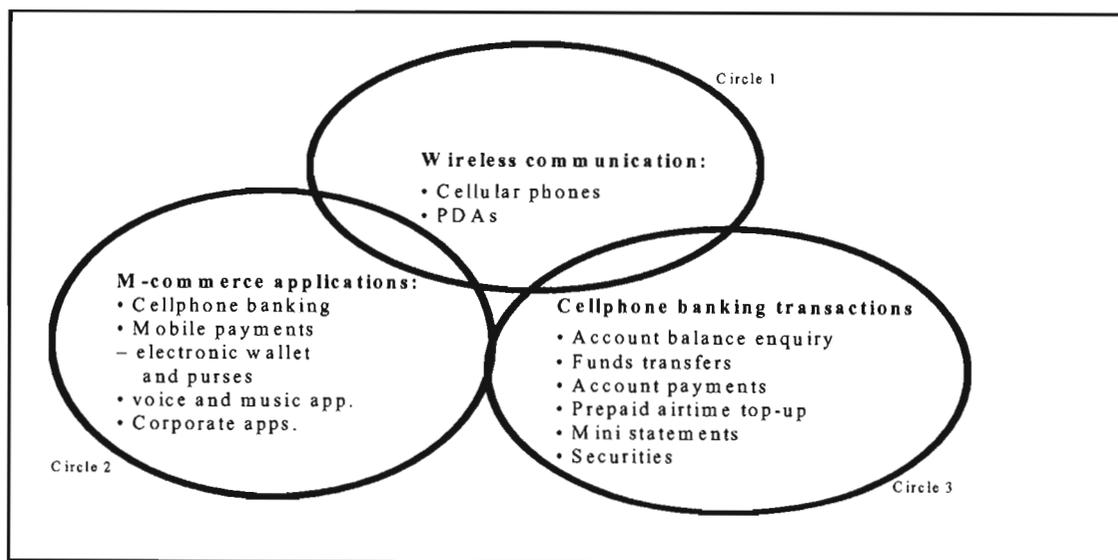
Source: Internet 4, 2003:19

The services offered are said to be similar across banks in South Africa. Even the features on services offered are similar with little differentiation.

2.4 Cellphone Banking Service

Wireless technology enables communication to the handheld electronic devices without the use of fixed networks. Thus, as indicated in Circle 1, Figure 2.2, such devices include cellular phone, notebook computers and other mobile devices such as personal digital assistants (PDAs) (Scientific American, 2000). Cellphone banking is also referred to as mobile banking. M-commerce extends to the provision of cellphone banking services by financial institutions, as shown in circle 2 of Figure 2.2.

Figure 2.2: Wireless Communication structure



Source: Levin J and Wolfenden R. (2000:42)

Mobile commerce applications bring banking closer to customers, and allow them to develop self-service procedures giving them greater control over how, where and when they can carry out their banking transactions. For banks there are some immediate reasons to become involved in M-commerce. The short-term motivation is a defense measure to prevent mobile network operators from leveraging their close relationship with mobile customers into a full banking service. Cellphone banking also allows banks to add an extra

distribution channel to reach customers, which offers cost savings by providing a cheaper alternative than the current investments in a physical branch network (Attwood and Duncan, 2000).

Cellphone banking is a banking channel, which enables customers to perform banking transactions directly on their cellphone handset, as detailed in Figure 2.2, circle 3. Customers are able to access their accounts in order to check account balances, make transfers, pay bills and perform various other transactions (Birch, 2000). This innovation follows the relatively successful introduction of Internet banking, whereby customers can access their bank accounts, through the bank's web site.

Approximately one third of Internet users in South Africa make use of this channel, an estimate arrived at on the basis that there are approximately three million Internet users (Goldstuck, 2002). The number of Internet users is nevertheless small in comparison to the 15-million cellphone users. The cellphone network is the most likely platform for value-added services, such as online banking and mobile commerce offerings to reach critical mass (Manson, 2002). Epaynews (2002), however reports that according to the Management Consulting firm AT Kearney, worldwide, less than 3% of cellphone users having Internet-enabled phones actually used them for banking. Goldstuck (2002) similarly reports that in South Africa, cellphone access to the Internet has been a non-starter, which implies cellphone banking too has not been widely adopted.

In South Africa, there are currently two alternative cellphone banking technologies available for conducting cellphone banking – WAP (Wireless Application Protocol) and WIG (Wireless Internet Gateway). WAP is an application environment and a set of communication protocols for wireless devices designed to enable manufacturer vendor, and technology independent access to the Internet and advanced telephony services (IEC, 2001). WIG is an SMS (Short Message Service) based service, in which a menu of available banking options is initially downloaded from the bank to the

32K Subscriber Identity Module (SIM) card in the cellphone, and presented to the user through the cellphone's menu (Vodacom, 2001:34).

Two important factors to consider in comparing these technologies are security and costs. The introduction of WAP 2.0 has overcome several problems with this protocol, including that of security (WAP Forum, 2002:17). In a similar manner WIG's encrypted signature also provides comparable security (SmartTrust, 2002). In terms of costs, WAP is more expensive than WIG because it requires the consumer to make a call to perform a banking transaction, in much the same way as a dial-up call is made for Internet access from a personal computer. WIG on the other hand utilises SMS for transactions and can therefore potentially cost the price of sending an SMS, which is comparatively cheaper. The cost of the WAP enabled phone may also be more expensive than that of the WIG – enabled phone, the only requirement for the latter being a 32 K SIM card in the handset (Internet 3, 2003: 6).

2.5 Is Cellphone Banking the Way Forward?

Andre Zitzke: Solution Architect, SAS Institute (June 2002) states that e-business has not enjoyed the predicted growth expected for SA because computer based e-business is simply not viable in South Africa. This is due to the fact that the majority of the population does not have access to computers. Cellphone banking, on the other hand, could spread swiftly to the mass South African market.

According to Zizke (2002), South African banks need to be innovative about e-banking and offer cellphone and PC-banking to their customers. This is because South Africa lacks the economies of scale essential for widespread e-banking to service the vast majority of people. Therefore, banks must offer an alternative e-medium. The alternative is to consider offering customers interactive communication via cellphone devices. The cellphone is becoming ubiquitous. It is wireless, ever available, easy to use, the infrastructure is already in place and it is already penetrating the rural communities. As a

result, this must become the logical means of interacting with the emerging markets. Several banks in South Africa have already introduced banking by cellphone, but at this stage the service is only used by the “Yuppies”. But, as soon as it becomes easy to do a banking transaction via cellphone, as it is to make a call (and when WAP costs become more acceptable), cellphone banking could spread speedily to the mass market.

According to Zitzke (2002), cellphone banking seems to be the way to go in South Africa. Mobile banking in Europe will be discussed next, in order to compare whether Europe follows the same trends as those described by Zitzke.

2.6 Mobile Banking in Europe

According to the Reuters Business Insight report (2002) European countries are the leaders in developing M-commerce solutions. Consequently mobile banking offerings are prevalent in Europe, which means that therefore mobile banking best practices can be learned from Europe. Mobile banking offerings in European countries are detailed below (Reuters Business Insight, 2002: 54-67).

2.6.1 Mobile Banking in Finland

Finland already has the highest mobile penetration rate in Europe, at over 75% in 2002. With Finnish mobile phone manufacturer Nokia driving development of M-commerce, Finnish people have been quick to adopt the WAP-enabled phones. Internet penetration in Finland is also high, and the Internet banking market is one of the most advanced in Europe. Having attracted large numbers of Internet banking customers, Finnish banks were early in developing mobile banking services.

Leading the way in these developments is the Finnish-Swedish retail bank, Merita Nordbanken (which changed its name to Nordea in December 2001).Nordea's mobile banking service was not only the first WAP-enabled

banking service to be piloted in Europe, it is also the most advanced in terms of range of services, offering retail banking services and various other value-added services.

Considering Finland's high rate of Internet and mobile penetration, market leading development of mobile banking services, well-developed mobile communications infrastructure, and the presence of industry driving companies like Nokia, it is forecast that the number of WAP-enabled mobile banking customers in Finland will reach 800,000 by 2005. This will represent 10% of the population and 20% of WAP-enabled mobile phone subscriptions.

2.6.2 Mobile banking in France

While mobile penetration in France is currently below the Western European average, it is predicted to grow quickly and reach almost 80% by 2005. The number of M-commerce and phone subscriptions enabling mobile banking will also rise quickly during the next few years to help facilitate strong growth in the number of mobile banking customers during this period.

France has already been progressive in the development of M-commerce and mobile banking solutions and it will continue to be important in the development of mobile banking during the next few years. Network operators, France Telecom and SFR are both strongly committed to the development of GPRS and 3G mobile solutions. Also, Internet communications/network solutions companies such as Alcatel are playing a leading role in the development of mobile solutions for financial services application providers. For example, SFR teamed with French banks Societe General, Credit Commercial de France, Banque Direct, and Credit Mutuel to launch e-medi@, one of Europe's first mobile banking solutions. The GSM home banking service, which is based in Alcatel's WAP solution was launched as a 'friendly user' trial in 1998 and then as a full commercial service in 1999.

Considering France's early development of mobile banking services, rapidly rising mobile penetration rate, firm alliances between network operators,

infrastructure providers, and financial services companies, and the strong expected growth in the Internet banking, it is forecast that the number of WAP-enabled mobile banking customers in France will reach 2.6 million by 2005. This will represent 4,3% of the population and 10,5% of WAP-enabled mobile phone subscriptions.

2.6.3 Mobile banking in Germany

Mobile penetration in Germany is said to be similar to that of France, where it is currently below the Western European average, but it is predicted to rise quickly during the next few years to reach almost 68% by 2005. Also similar to neighbouring France, the forecast growth of M-commerce and phone subscription enabling mobile banking is strong.

While development of mobile banking services has been slower in Germany than in France and Scandinavia, Germany is widely considered as one of the key areas for strong development of mobile banking services. German mobile network operators, such as Mannesmann and DeTeMobil are driving the development of mobile banking services. Mannesmann has teamed up with Deutsche Bank and Nokia to launch the first WAP-based mobile banking service in Germany. The WAP service, which was demonstrated at the CeBIT trade show in March 2001, then launched to Deutsche Bank customers, is designed to offer the same online brokerage functions as Deutsche Bank 24 and Deutsche Bank's private banking division. It allows customers to buy and sell shares, check their account balances, and obtain stock price information for various stock markets.

2.6.4 Mobile Banking in Italy

Italy represents an extremely interesting mobile communications market, with mobile penetration already high and close to the peak of its growth curve. With mobile penetration already over 50 % in 2002, and it is expected to continue rising, but at a slower rate, to reach almost 75% in 2005. Also by 2005, the proportion of mobile phones that are WAP-enabled is expected to

approach 60%, highlighting the significant potential for the development of M-commerce and mobile banking services.

It is forecast that by 2005; the total number of Italian mobile banking customers will be greater than the total number of internet banking customers, making the Italian banking market unique in European terms. While a significant proportion of Italy's mobile banking customers will also be Internet banking customers, some will only access their functional services via mobile phones and traditional banking channels.

There are several factors driving this unusual trend.

- Italian banks and financial services companies have been slow (in Western European terms) to develop Internet banking services. This is largely because PC penetration is low in Italy, and therefore, Internet penetration is also low. This is driven by two main factors

- 1) Internet usage has been hampered back by high telephone charges.

- 2) Adoption of the Internet has been particularly slow in schools and universities, which has had a domino effect on the rest of society. An Internet culture is beginning to emerge, but this will take time to reach levels witnessed in other Western European countries.

- Mobile phone culture has become particularly strong in Italy. For example, mobile penetration is already high (50.9% in 1999) and forecast to continue rising to approach the 70% mark by 2005.
- The relatively slow development of electronic channels by financial services companies in Italy has meant that the main competitors have just recently launched comprehensive Internet strategies that incorporate multi-channel distribution of a whole range of products and services. Therefore, there will soon be an influx of mobile service offerings available to the large volume of Italian mobile phone users.

- Online stock trading is becoming very popular in Italy, with most of the major retail banks developing comprehensive online stockbroking services. The fact that mobile phones provide an ideal distribution channel for online stockbroking services means that the banks and discount stockbrokers are in an ideal position to target mobile users with their stockbroking services.

Due to the slightly unusual nature of the Italian banking market at the moment and the strong mobile phone culture, the number of Wap-enabled mobile banking customers in Italy is expected to reach 2.35million by 2005. This will represent 4.1% of the population and 10% of Wap-based mobile phone subscriptions.

2.6.5 Mobile Banking in Spain

While Spain currently has one of the lowest mobile penetration rates in Western Europe, this rate is forecast to rise quickly to almost 63% in 2005. By this time, Wap-enabled mobile phones will represent slightly over half of all Spanish mobile phone subscriptions, highlighting the potential for the growth of mobile banking services.

The progressive development of Internet banking in Spain, including strong Internet banking services from BBVA, BSCH's Open Bank, eBankinter, and the newly formed Unofirst, will undoubtedly pave the way for the development of a range of mobile banking services. By the end of 2000, there were over 1.25 million Internet banking customers in Spain, making it a larger Internet banking market than Sweden. Reuters stated that by 2004, over 6% of the Spanish population would be banking via the Internet; this represents a tremendous opportunity for banks to integrate mobile banking into their Internet strategies.

Present mobile banking developments include several message-based services available on GSM phones. These are available from eBankinter

under the name Bankintermóvil and BSCH's Open Bank. Similar to the UK, where banks began by introducing message-based mobile banking services, Spanish banks will soon progress to offering Wap-based mobile banking services, including transactional services, such as transferring funds between accounts and making bill payments.

While there is currently little mobile activity from banks and discount stockbrokers in offering mobile stockbroking services, there has been a recent development in providing insurance services via mobile phones. Adeslas, a Grupo Agbar health insurance company, and AGM, a multimedia services company, have developed a Wap-based service which allows customers to access Adeslas' Internet services.

This makes Adeslas one of the first European insurance providers to use the mobile distribution channel to enhance their electronic service offering.

The number of mobile banking customers in Spain will rise quickly once the supply and penetration of Wap-enabled mobile phones increases and once providers begin to offer transactional, Wap-based mobile banking services. The number of Wap-enabled mobile banking customers in Spain is expected to reach 1.25 million by the end of 2005 making it the fastest growing mobile banking market in Western Europe. These 1.25 million Wap-enabled mobile banking customers will represent 3.1% of the population and 9.4% of Wap-based mobile phone subscriptions.

2.6.6 Mobile Banking in Sweden

Sweden currently has the third highest mobile penetration rate in Europe, lower than only Finland and Norway. By 2005, Sweden is predicted to have the highest mobile penetration rate in Europe at 76%. This is the main factor driving Sweden's leadership in the development of M-commerce applications.

Along with the other main Scandinavian countries, Sweden is widely considered to be the leader in the development of mobile banking Services.

Not only were Swedish banks among the first to offer mobile banking services to their customers, they also offer some of the most advanced and comprehensive mobile banking services in the world.

Leading the way in the development of mobile banking services has been Merita Nordbanken, the Finnish-Swedish retail bank, which was also ahead in developing Internet banking services. With high Internet and mobile penetration rates and strong customer adoption of its Internet banking service, Merita Nordbanken decided to develop other channels for accessing its Internet banking services, such as the Wap-enabled mobile phone.

Other large Swedish banks, such as SEB and Svenska Handelsbanken were also ahead in developing mobile banking services. Similar to Merita Nordbanken, they also offer a combination of simple retail banking services and stockbroking services. The main factor driving Swedish banks' leadership in the development of mobile banking services is the advanced development of their Internet banking services. Not only are they rated among the best in the world; they have also attracted large number of customers. Now, Swedish banks are aggressively developing mobile banking services both to provide new ways for existing customers to access these services, and to target customers who do not have access to PCs and the Internet, but who do have access to a mobile phone. In Sweden, this target group represents a large number of people.

Sweden will continue to be a leader in the development of mobile banking services, setting the standard for other European countries to follow. The number of Wap-enabled mobile banking customers in Sweden will reach 880,000 by 2005. This will represent 9.8% of the population and 20,2% of Wap-based mobile phone subscriptions.

2.6.7 Mobile Banking in Switzerland

Mobile penetration in Switzerland is slightly below the European average, but is predicted to increase rapidly rising to over 70% by 2005. The growth of

phone subscriptions enabling mobile banking is also forecast to be strong during the next few years.

UBS and Credit Suisse are currently driving the development of mobile banking services in Switzerland, where they have both launched Wap-based mobile banking services. Similar to the development of mobile banking in Germany, Swiss banks are initially offering stockbroking services, rather than simple retail banking services. Both UBS and Credit Suisse recently launched Wap-based mobile stockbroking services, which allow discount brokerage customers free access to stock market information and analysis via their mobile phones. The popularity of mobile stockbroking services will steer the development of mobile banking services in Switzerland.

It is anticipated that UBS and Credit Suisse, which have both proved to be leaders in the development of electronic distribution channels in financial services, will develop additional mobile banking services, such as simple retail banking, loans and credits, and insurance services.

Considering the steadily increasing mobile penetration and the strength of the leading retail banks, which are driving the development of mobile banking services in Switzerland, there will be almost 400,000 Wap-enabled mobile banking customers in Switzerland by 2005. These people will represent 5% of the population and 11.8% of Wap-based mobile phone subscriptions.

2.6.8 Mobile Banking in the United Kingdom (UK)

In 1999, mobile penetration in the UK was only slightly above the European average, at almost 39%. However, it is rising quickly and expected to be one of the highest in Europe by 2004. With tremendous publicity surrounding the auctioning of 3G mobile licenses in the UK, the growth of Wap-enabled and 3G mobile phone subscriptions is also predicted to be strong.

There have been SMS based mobile banking services for several years in the UK. For example, Barclays Bank first entered the mobile banking market in

1995 and by 1997 was offering its customers an SMS-based mobile banking service. Also using SMS-based messaging, HSBC currently offers its direct banking customers access to their account information and recent transactions.

However, compared to some other European countries, the development of Wap-based services in Britain has been relatively slow, with only a few banks, such as the Bank of Scotland and The Woolwich, offering Wap-based mobile banking services to their customers.

There is considerable excitement surrounding mobile banking in the UK and the UK financial services market is currently on the verge of an eruption of mobile banking services. Many banks and financial services companies, such as Halifax and Prudential, have officially announced their intention to provide mobile banking services in the near future.

Considering the UK's fast rising mobile and Internet penetration rates and the explosion of financial services companies launching mobile banking services in 2000, there will be 2.97million Wap-enabled mobile banking customers in the UK by 2004. This will represent 5.1% of the population and 10.6% of Wap-based mobile phone subscriptions.

Europe has laid a foundation for the development of mobile banking. A trend has been set by Europe for the other countries considering launching mobile banking to follow. Finland has the highest mobile phones penetration compared the other countries in Europe. France and Germany have the similar penetration rate. In the (Reuters Business Insight report, 2002) it is projected that the mobile phones penetration in will increase in European countries. European mobile banking participants will be discussed in the next section

2.7 Mobile banking participants

Mobile Research On-Line (2003) identifies some of the cutting-edge companies, which are leading the way in the development of mobile banking services, and examines at the different approaches to the provision of these services. The companies highlighted are from the UK, Sweden, and Finland, as well as one particularly innovative bank from the Czech Republic.

2.7.1 The Woolwich

The Woolwich offers the UK's first mobile banking service, which is available through its Open Plan banking service. Open Plan banking was launched in 1999 as "a new approach to finance" and billed as "private banking for the masses". The plan is to deliver a fully integrated personal banking service to the mass market at low cost. The plan also involves offering customers a range of channels, through which they can access their banking services, including Internet, telephone, mobile, and interactive TV (iTV) banking. Therefore, it was important for The Woolwich to be an early mover in the UK mobile banking market. The Woolwich marked its commitment to this new concept by announcing that it would invest \$125 million (Euro214 million) during 2000 to 2003 in developing Open Plan banking across the UK.

After conducting initial customer trials of its mobile banking service, The Woolwich found that there are several different types of mobile banking customers, and that mobile users are not necessarily the same as Internet and iTV users. This finding supports The Woolwich's strategy, which is to provide distribution channels, which cater for all types of customers. Strategists within the bank believe that mobile banking customers will not only be a subsection of Internet banking customers, but that there will also be customers who use the mobile banking service as the main channel for accessing their account information. For The Woolwich, success is not solely dependent on the success of the mobile channel, but rather on providing its customers with access to all channels.

The Woolwich's mobile banking service was developed in partnership with mobile phone manufacturer Nokia and UK network operator Vodafone, which would be recommended to customers, but was not required, since The Woolwich's Wap server and gateway is located in-house and the service has complete operator independence. The Woolwich offered a discount on the purchase of a Nokia 7110 phone for customers who opened an Open Plan account. This is an example of a bank attempting to create critical mass by reducing one of the most significant initial barriers to entry. This strategy is particularly useful at the moment, since the penetration of Wap-enabled phones in the UK is currently still low.

The Woolwich has chosen to start by offering simple retail banking services, rather than stockbroking services, and currently customers can:

- Check the balance of any accounts held with the Woolwich, including savings, current, mortgage, ISA, and unit-trust accounts.
- View the 10 most recent account transactions.
- Transfer funds between accounts, including the ability to set up transfers on specific dates up to six weeks in advance.
- Make bill payments.
- Set up and amend direct debit mandates.
- View up-to-date credit card transaction records.

According to the Woolwich's Electronic Channels Manager (Internet 4) , there is also tremendous potential for mobile stockbroking services in the UK, and The Woolwich is currently developing such a service to complement its existing service. However, its Electronic Channels Manager also believes that there is less potential for the sale of other financial service products via mobile phones, such as insurance products and mortgages. These kinds of products

are more likely to be purchased through other distribution channels, especially via the Internet. The Woolwich's development of mobile stockbroking services is likely to motivate a partnership with an online stockbroker and information provider.

A range of value-added services is also being offered through The Woolwich's mobile banking service, including news, weather, and sports information, which is aggregated by i2mobile.com. Further value-added services are also planned, with the Woolwich adopting the strategy of becoming a mobile portal itself, rather than being a content provider for other mobile portals. By entering the mobile banking market early it should be able to gain a strong position in the overall M-commerce value chain and to maintain control over relationships with its customers.

It is too early to analyse how successful The Woolwich's mobile banking service is, but the bank's objective is to gain 2 million Open Plan customers by the end of 2005. Ideally all of these customers will be using the mobile banking service.

According to The Woolwich's Electronic Channels Manager: "Mobile banking is HUGE in the UK – soon everybody will be doing it."

2.7.2 Nordia Bank

Nordia Bank (formerly named the Merita Nordbanken) was the first bank in Europe to develop and pilot a Wap-enabled mobile banking service and has since led the way and set the standard for other European banks and financial services companies to follow. Its mobile banking service was launched to customers in October 1999.

Having established a strong presence in the Internet banking market, Merita Nordbanken decided to develop another channel through which its strong base of Internet banking customers could access their financial services: the Wap-enabled mobile phone. Progressive by any definition, Merita

Nordbanken started offering telephone banking in 1982, PC banking in 1984, text message-based mobile banking in 1992, Internet banking in 1996, TV banking in 1998, and finally, Wap-enabled mobile banking in 1999. It has been this early pioneering strategy that has gained Merita Nordbanken a market-leading position in the European mobile banking market.

Senior executives at Merita Nordbanken believe that providing an extensive mobile banking service is a vital part of the bank's overall strategy and one that will help it to provide new value for its customers, as well as a way of retaining marginal customers who might otherwise choose another bank.

Merita Nordbanken's mobile banking service is being developed in partnership with Nokia and Visa, and is available to all Solo banking customers, of whom there were over one million at the end of 1999. This number grew from 600,000 at the beginning of 1999, highlighting the strong growth in Merita Nordbanken's Internet customer base. Also at the end of 1999, approximately 290,000 of its Solo customers were in Sweden and approximately 730,000 were in Finland. The total number of Solo customers has since grown to over 1.2 million. Given that its mobile banking customers are a subsection of its Internet banking customers, and because it only tracks online transactions, it is difficult for Merita Nordbanken to know exactly how many mobile banking customers it has.

This strong growth in customer adoption of mobile banking services is partly driven by phenomenally high mobile penetration rates in both Finland and Sweden, but is largely a result of Merita Nordbanken's extensive range of services. Currently, Merita Nordbanken's mobile banking customers can:

- Check the balance of all accounts held with Merita Nordbanken.
- View recent account transactions.
- Make bill payments, both domestically and abroad.

- Transfer funds between accounts.

- Check when bills are due.

- Process direct debit mandates.

- View recent Visa card transactions.

- Trades stocks and shares and receive portfolio and price information.

- Send and receive customer mail.

- View short news items from the bank.

Solo customers can also access the Solo Mall, which is a fast growing electronic marketplace for merchants from whom customers can purchase a wide range of products and services by means of real-time transactions. The Solo Mall provides the links to these merchants and the Solo payment system allows customers to pay for products directly from their Merita Nordbanken accounts. There are currently over 900 merchants offering products and services to Merita Nordbanken's Internet banking customers. At the moment, more than 350 of these merchants offer their products and services to Wap-enabled mobile customers, and this number was predicted to rise quickly during 2004. Merita Nordbanken's management team believes that this is one of its most important value-added services and that it is the one which differentiates it from the competition.

As is expected from a strong market-leading competitor, Merita Nordbanken is already well on its way to developing the next phase of its mobile banking service. The EMPS (Electronic Mobile Payment Services) service is hailed as the next progression from Wap-enabled mobile banking. It utilises dual-slot mobile phones with separate chip cards: one for the telephone service and one for banking transactions. This concept will effectively allow mobile phone users to carry their credit cards within a mobile phone, and offers a wealth of

possibilities for making both short and long distance payment technologies. The mobile phone will act as a credit card reader, and, combined with technologies like Bluetooth, will facilitate a whole range of mobile transactions.

Not only does Merita Nordbanken's extensive range of mobile banking services highlight its early entry into the European mobile banking market, it also highlights its view that there is no one major application of mobile banking. For Merita Nordbanken, the more powerful application of M-commerce is the mobile banking service as a whole.

Merita Nordbanken's early entry into the European mobile banking market has placed it in a very strong position within the overall M-commerce value chain; however, it accepts that it will not be long before other retail banks catch up with it in terms of service offering.

According to Merita Nordbanken's Vice-President of Payments and Network Banking: "Banking in general is the killer application of m-commerce because it is most suited to mobile technology. This means that banks have considerable power in the equation."

2.7.3 Expandia Banka

Czech Republic online bank, Expandia Banka was one of the first banks in Europe to offer a mobile banking service to its customers (this excludes banks offering purely text message-based services). The service, which uses SIM Toolkit technology, was launched in July 1998, only one month after the bank was officially opened.

Purely a direct bank with no branches, Expandia's business strategy is to be innovative and to differentiate itself from the competition. Therefore, launching a mobile banking service was an important part of its strategy.

Although the transactions take very slightly longer than those of a Wap-enabled mobile banking service, Expandia's SIM Toolkit-enabled service offers a similar range of simple retail banking transactions. Currently, its customers can:

- Check the account balance of all accounts held with Expandia.
- View the last five account withdrawals and the last five deposits.
- View exchange rates and bank interest rates.
- Transfer funds between accounts.
- Open long-term accounts.
- Receive customised SMS alerts reminding them of anything relevant to their banking activities.

According to the Research Online (Internet 4) Expandia views the SIM Toolkit as its bridge to Wap technology, and will eventually adapt its mobile banking services for access via WAP-enabled mobile phones. However, this depends on the penetration of Wap-enabled phones, which is expected to be significantly lower in the Czech Republic than in most Western European countries. The switch to Wap will only happen when Wap-enabled phones are widely available.

There are benefits of using SIM Toolkit technology, such as the ability to make the service as user-friendly as possible, which not only reduces one of the barriers to entry, but also makes it easier for customers to familiarise themselves with banking via their mobile phones.

Expandia's SIM Toolkit mobile banking service is already being used by approximately 30% of its Internet customers, who number to at least 6,000 mobile banking customers. The mobile phone is fast establishing itself as the

second most popular electronic access channel at Expandia. Expandia expects the volume of transactions taking place via mobile phone to increase significantly during the next few years.

One of the factors that makes Expandia Banka an interesting and innovative player in the mobile banking market is its forward-looking approach and strategy. For example, it is currently in the process of exploring new ways of developing its mobile banking service. There are several potential new product areas Expandia is currently researching and developing.

Mobile insurance products:

- Earlier in 2000, Expandia merged with the largest Czech Republic insurance company, creating a wealth of potential opportunities for the development of mobile insurance products. For example, simple insurance products like travel insurance could easily be sold via mobile phones. With Expandia's partner insurance company, its established mobile banking service, and its existing customer base, this represents a valuable opportunity for the cross-selling of insurance products.
- There are also specialised mobile banking accounts, such as a 'mobile account', which is an account purely for mobile phone transactions, rather than a combination of Internet and mobile transactions. There are two main advantages in offering this type of account:
 - 1) Transactions would be cheaper.
 - 2) Accounts can be tailored to meet the needs of certain customer segments.
- Another feature is the electronic distribution of pay-as-you-go phone coupons. Pay-as-you-go mobile phone subscriptions are extremely popular in the Czech Republic. Therefore there is tremendous potential for distributing them electronically, rather than physically. The concept of selling pay-as-you-go coupons electronically would enable Expandia to

'extend' its customer base by targeting customers who are attracted by the convenience of not having to go to the store to purchase new pre-pay coupons.

These innovative product and service ideas help to explain Expandia's segmentation of current target markets for mobile banking services, which is as follows:

- Existing customers;
- Students, for example, through a mobile account;
- SMEs – there is potential for the development of business-to-business banking services via mobile phones, which would reduce each company's administrative costs and allow business to bypass certain sections of the overall business-to-business payment cycle. Expandia would greatly benefit from this type of service by increasing the number and size of corporate transactions and deposits.

Expandia Banka is currently in a strong position in the Czech Republic mobile banking market, largely due to its innovative and forward-looking business strategy and its early entry into the market. It also has a major advantage over its direct competitors through its partnership with the country's leading insurance provider. However, Expandia also anticipates that it will not be long before its competitors offer comparable mobile banking services.

According to Expandia Banka's Director of Business Alliances: "The killer application of the future is the ability to integrate payment into the mobile phone – your bank in your pocket..."

2.7.4 SEB (European Bank)

SEB is at the forefront in European Internet banking, launching its service in 1996 and attracting over 380,000 customers, (who currently represent

approximately 25% of its total retail customer base). In partnership with mobile phone manufacturer Ericsson, SEB, based in Sweden, now offers mobile banking services to these customers, including both simple retail banking and stockbroking services.

One way in which SEB has differentiated itself from other mobile banking providers is through Mobile Research On-Line, its Wap service for institutional investors, which provides investors with a complete investment research service. The service provides the following functions:

- Stock quotes for 20 European and US stock exchanges.
- The generation of 15 different key figures for any of the 500 companies and the 13 countries Enskilda Securities cover with its research.
- A brief summary of the 10-30 research reports published each day by Enskilda Securities' 70 analysts. This services is also being complemented by another service, which allows customers to download more detailed summaries of these reports to hand-held computers (for example, Palm Pilots).
- A generation of graphics showing 30-day company share price performance.

SEB is also an outstanding example of a bank that has taken advantage of mobile banking for the provision of private banking services to high net worth individuals. SEB private banking was early to recognise the tremendous opportunity this customer segment provides. Both for SEB and other retail banks with private banking division, there are several reasons why private banking customers are a prime target market for mobile banking services.

- SEB's private banking business accounts for only 5% of its customer base, but approximately 50% of its profitability.

- The European wealth management market has recently seen a surge in the development of Internet services designed exclusively for high net worth individuals. Therefore, it is now more profitable for private banks to provide these customers with an additional channel for accessing these services.

- During the initial growth period of mobile banking, high net worth individuals are likely to be the first group of banking customers to have access to Wap-enabled phones. These customers are also likely to travel frequently and to appreciate the ubiquity of mobile services.

SEB private banking implemented a smooth transition from early market trials of its mobile banking service to a full commercial launch. It achieved this by offering WIG banking - an SMS-based mobile banking service in October 1998, then progressing to a Wap-enabled service in 1999. Following the introduction of the Wap-enabled service, SEB's strategy has been to implement rapidly new, but minor functions, while carefully monitoring customer experiences in order to improve shortcomings. Avoiding the implementation of major new functions is important, especially in the early stages of the mobile banking product life cycle, because it prevents customers from feeling overwhelmed and promotes a smooth period of adoption of new services.

SEB has been particularly innovative in its use of SMS-messaging to promote products and services to its high net worth customers. For example, it recently achieved a 50% hit rate from sending SMS messages to its private banking customers informing them of share trading opportunities.

European banks have been successful in launching the mobile banking offering. Perception of mobile financial services in Europe will be discussed next.

2.8 Perceptions of Mobile Financial Services in Europe

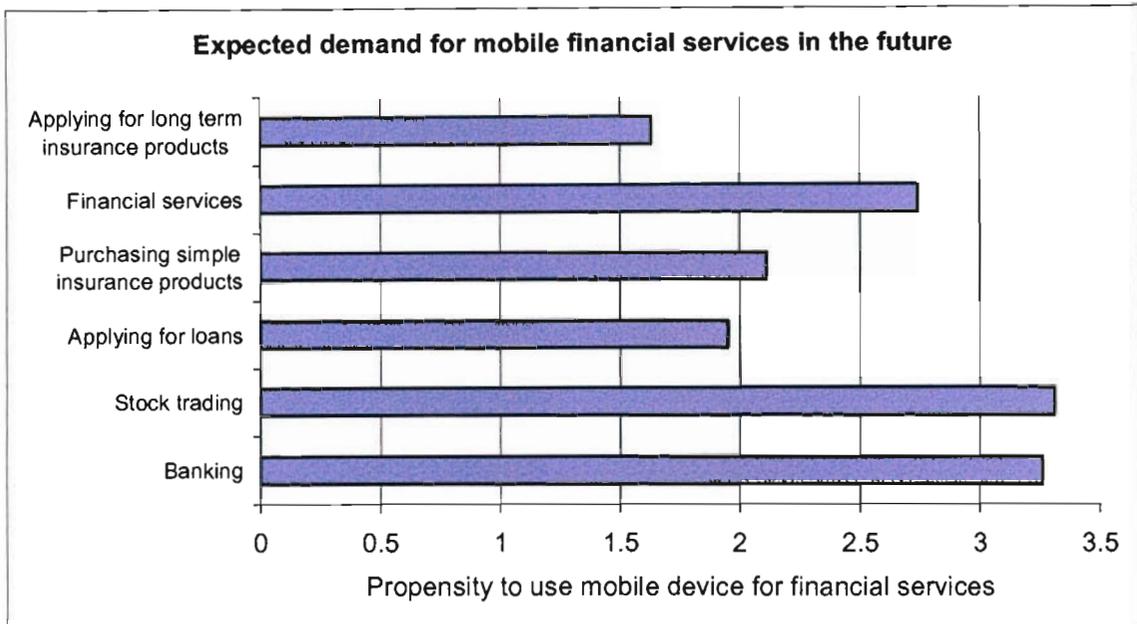
In October (2001), Reuters Business Insight conducted a research survey of European financial services companies and investigated their opinions and insights into a number of key areas relating mobile financial services. The issues covered included:

- Mobile financial services of the future
- Features of a successful mobile financial service
- Barriers to success for participation
- Future strategies that will prove to be successful.

2.8.1 Mobile financial services in the future

In the research survey analysis in Figure 2.3 and Table 2.3, a score of three represents a neutral position. The first bar in the diagram indicates that on average, financial service will only be rarely accessed through mobile devices. While this might at first seem like a pessimistic forecast, it has to be seen in the light of prevailing European market conditions. Internet-ready mobile telephones are still uncommon, and many financial institutions see the demand for these services as distant prospects.

Figure: 2.3 Expected demand for mobile financial services in the future



Source: Reuters Business Insight survey, 2001:39

Examining the details behind the findings, it is more encouraging to find stock trading and banking both slightly above three, albeit only marginally, and therefore do show promise for future mobile services. In future the mobile banking solution will be utilised even more by consumers. Therefore, the penetration of the mobile phones will grow further.

Table 2.3 How Popular will mobile financial services be in the future

Banking	3.26
Stock trading	3.31
Applying for loans	1.95
Purchasing simple insurance products	2.11
Financial services	2.74
Applying for long term insurance products	1.63

Source: Reuters Business Insight survey, 2001: 40

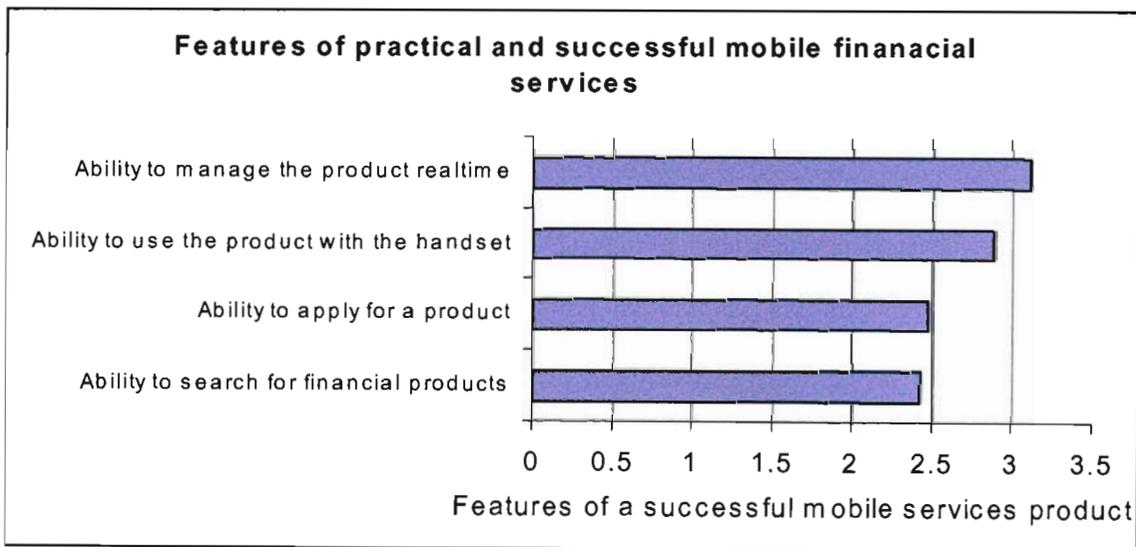
It seems that for the foreseeable future, mobile financial services will be limited to frequent, transactional services such as banking and stock trading. This is necessarily a feature of handset functionality and ergonomics.

Products such as general insurance products, loans and long-term insurance products would demand too much from the display and interfaces available on existing mobile devices, and in many cases there is still a very strong demand for personal contact when purchasing complex financial services products.

2.8.2 Profiling the successful services

In the following analysis, Figure 2.4, a score of three represents a neutral position in the profiling the successful services. It is expected that mobile devices will not be used to search for or apply for a financial services product. The mobile telephone is regarded as a practical tool with which to manage a current financial product or series of related services. This links in with the view that mobile services will be restricted to banking and stock trading.

Figure 2.4 Features of practical and successful mobile financial services

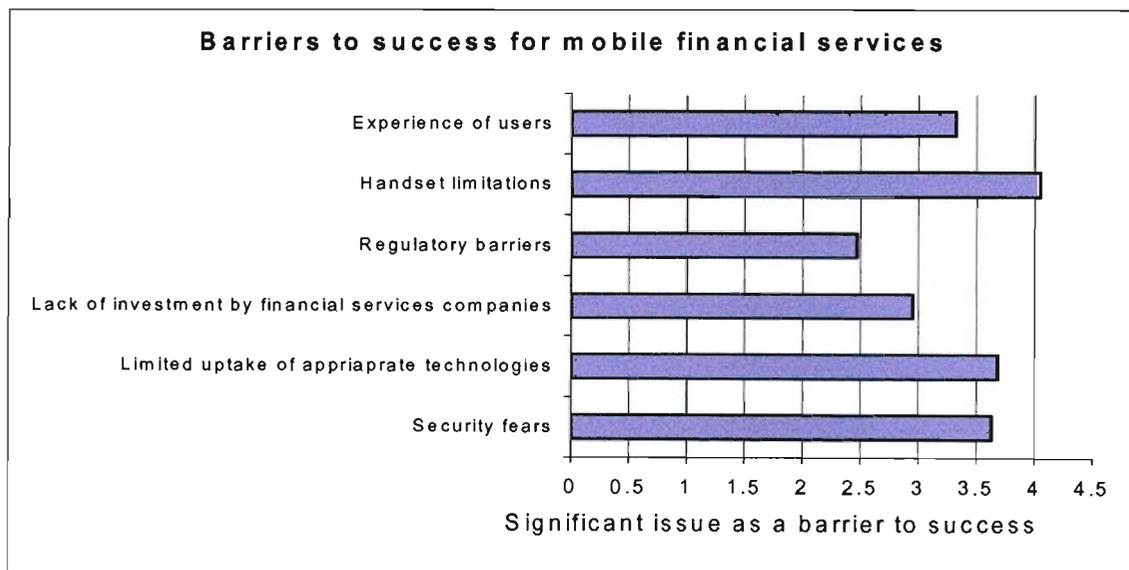


Source: Reuters Business Insight survey, 2001:43

2.8.3 Barriers to success

In the analysis of factors creating barriers to success in Figure 2.5, a score of three represents a neutral position – for example, anything scoring less than three is not regarded as an issue, which will limit significantly the take-up of mobile financial services. The most significant potential problem for the future is the limitations of existing handsets. Despite developments in devices with larger screens, devices, which can support full, colour web pages and enhancements to user friendliness, the limitations of the device are still regarded as a problem by the respondents to the survey.

Figure 2.5 Barriers to success for mobile financial services



Source: Reuters Business Insight survey, 2001

The most significant features appear as a group of three, comprising security fears, limited uptake of appropriate technologies and experience of users.

□ **Security fears**

Despite the significant investments in security and encryption technologies, and also in the marketing and promotion of the security of the Internet and mobile technology, the mobile financial services providers of the future still expect security to be an ongoing issue which will stand in the way of mobile financial product uptake.

□ ***Limited uptake of appropriate technologies***

This response is a direct result of the prevailing European mobile telephone market conditions. With only a few exceptions, most of the European markets in this study do not have significant penetrations of Internet-enabled mobile phones, and the financial services companies do not anticipate a sudden change in this profile. It is likely that more financial services companies will begin offering Internet-enabled mobile phones to encourage uptake of the mobile services being offered.

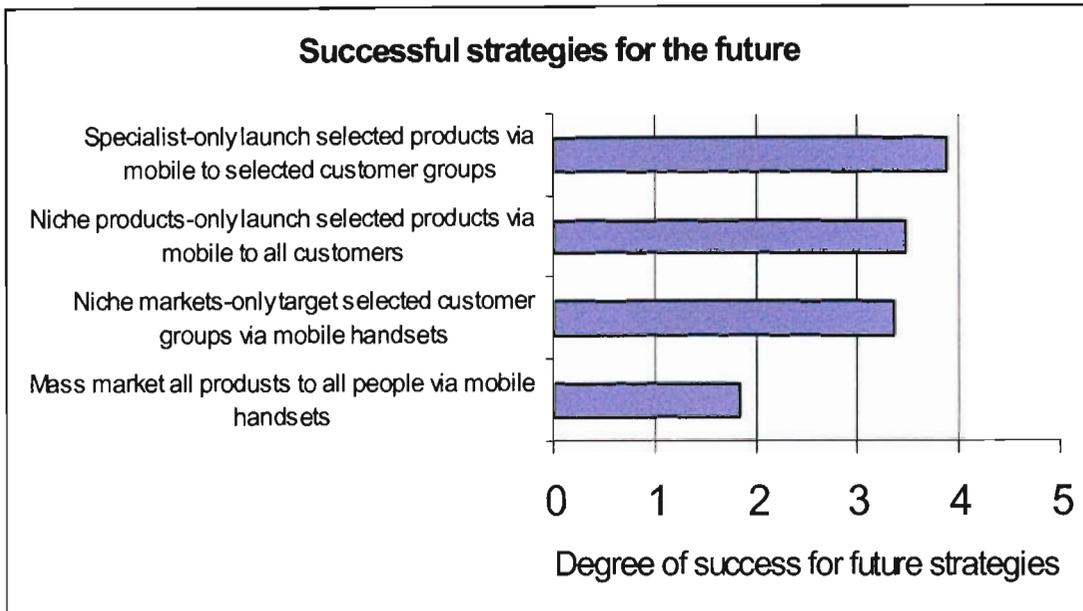
□ ***Experience of users***

This is an interesting feature, which cannot really be influenced. The most active mobile phone users are typically below 18 years of age and as such are not eligible for the vast majority of financial service products. However, once this population segment begins to purchase financial services products, it is expected that demand for mobile financial services will begin to accelerate.

2.8.4 Future strategies for success

In the analysis of future strategies for success in Figure 2.6, a score of three represents a neutral position – for example a score of less than three indicates that respondents do not consider this strategy to be successful in the future. There was a high degree of consensus that a mass-market strategy would not be affective for the promotion of the mobile financial service products.

Figure 2.6 Successful strategies for the future



Source: Reuters Business Insight survey, 2001:45

There was only a marginal difference between the strategies “Niche Product” and “Niche Market” which at first sight, is surprising, given the levels of consensus regarding the future success of specific financial services products, it will be generally considered that banking and stock trading alone would alone be successful. However, the implication of this is that there may well be specific groups of individuals for whom the mobile device will be an indispensable tool for managing their affairs, independent of the mobile devices complexity.

Directing a specialist strategy was regarded as the most successful future mobile financial services strategy. This will require the successful companies to have detailed and flexible customer segmentation techniques. Typically, this is not a feature of most traditional financial services companies. The larger and more established financial services companies typically have complex, multiple systems, which do not exchange information regarding specific customer product ownership. As a result, it may be the newer, smaller or out-of-sector companies that will be best placed to deliver mobile financial services products.

The Reuters Business Insight research survey indicates that mobile commerce still has an opportunity to succeed and be utilised by consumers. The fear of security and a lack of experience in utilisation currently hamper its success. Recommendations made are that strategies for the future must be derived, such as Niche products need to be launched via mobile phone to all customers. Fit for purpose services need to be launched and must be simple to use.

It is imperative to also look at the type of consumers that will bank via a cellphone, as not all consumers will be comfortable to use a cellphone for banking. The services to be offered via a cellphone and the type of consumer who will utilise a cellphone for banking compliment each other to determine a mobile banking value proposition. The next study investigated consumers that bank on cellphones.

2.9 Who's banking on Cellphones?

A study was conducted by Benjamin Ensor (2002) in Europe to identify the type of consumers who conduct banking transactions via a cellular phone. Ensor findings revealed that two millions Europeans have used their cellphones to check their balances or conduct financial transactions. But relatively few others look ready to join the young optimists. Swedish and Germans consumers are the most enthusiastic about using their cellphones for banking.

Ensor's study revealed the following findings.

□ ***Cellphone Banking is not taking of***

While Internet banking is becoming mainstream – it is used by 18% of Europe adults – few Europeans use their cellular phones to bank online. Although 71% of Europeans use a cellular phone, only 1 % has been tempted to try cellphone banking.

□ ***Today's cellphone bankers are classic early adopters***

Cellphone bankers are young male technology optimists. They are cellphones fanatics: 38 % send text messages at least daily, 44% own a WAP Cellular phone, and they are nearly eight times more likely to use WAP services than Europe's average cellular phone user is. Few are new to electronic banking: 57 % bank on the Internet.

□ ***German and Sweden offer the best prospects for cellphone finance***

Although only two million Europeans have used cellphone banking to date, a further 20 million Europeans have used cellular phones to date, but not cellphone banking. 13 % of cellphone users are interested in using their cellphones to bank to trade stock. The Germans and Swedes are most interested, but few are willing to pay. Even in Germany, only 4% of cellphone users would pay \$5 a month for cellphone banking. Cost is a major consideration.

2.10 Wireless Retail Adoption in the United States

In the Gartner Forrester research, (B. Adrian, 2002) conducted a study on Wireless Retail Banking Adoption in the United States. His findings revealed that, for consumers to adopt wireless delivery of financial services, the proper balance must be struck between the benefits and inconveniences of the new medium.

By 2006, consumer adoption of wireless banking services is going to follow a fairly simple model based on a relationship between the value delivered by wireless services and the relative sacrifice required to attain that value. Before consumer adoption can dramatically increase, the value delivered by the mobility of services access, and the immediacy of the information available must outweigh the costs (monetary and otherwise) and inconveniences that

must be endured in using wireless services (in Figure 2.7). For consumers the wireless benefits they receive will have to value than what they have to “pay” or the inconveniences they must tolerate.

Figure 2.7 Weighting in on wireless retail banking services



Source: Forrester Research, 2002

According to B. Adrian (2002), in the minds of most U.S. consumers, the costs and inconveniences associated with performing wireless retail banking functions are relatively high. At an average cost of approximately \$50, airtime is still fairly expensive and the devices that can be used – telephone handsets and PDAs – offer suboptimal user interfaces of their small screens and lack of speedy input methods. At the same time, the perceived values of mobile access and information immediacy are fairly low. Being able to access an account balance, whenever and wherever desired, is not terribly compelling banking. As a result, consumer adoption is low in the United States because the right balance between value and costs has not been struck.

Table 2.4 M-commerce Comfortable levels of the US consumers (per device)

Status	Phones	PDA's
Not at all comfortable	65%	61%
Uncomfortable	21%	24%
Neutral	6%	7%
Comfortable	6%	6%
Extremely comfortable	2%	2%

Source: Forrester Research, 2002

The table 2.4 shows that most US consumers are still uncomfortable with the M-commerce offering. Therefore US still need to do a great deal of work to change consumer behaviour when it comes to M-commerce

2.11 Factors influencing non-adoption of Mobile Commerce

W. Levin (2000) conducted a study in Europe to identify factors contributing to non-adoption of mobile commerce. The study revealed certain non-adoption factors.

2.11.1 Device and technology security

Most E/M-commerce users have security concerns. There is a high perceived security risk. Simple and secure M-commerce solutions are not yet available.

2.11.2 One third fear a poor user experience

Users experience a high level of inconvenience, due to the poor user interface. Therefore customers perceive a low service value.

2.11.3 Complex technical, contractual and legal arrangements / M-commerce

There are fragmented technology standards. There are technology barriers to entry as well as the unavailability of 32k SIM cards. WAP enabled cellphones are not always available. Networks continue to introduce new technology carriers, such as GPRS, before WAP has been stabilised. The future evolution of technology is uncertain.

2.11.4 High costs

Due to limited utility, high costs will continue to affect the consumers. The higher the volumes the lower the service costs, as it takes banks longer to recover the invested costs to the service.

2.12 Bridging strategies revive wireless finance

Forrester research, conducted by Charlotte Hamilton (2002) reveals that finance firms stall their cellphone banking initiatives, hoping that technology progress will rescue them later. They should instead integrate WAP and WIG into simpler, more specific, service-oriented offerings. Hamilton recommended several strategies which banks should consider when reviewing their cellphone banking offering.

2.12.1 Firms must follow mobile consumers, not technology

According to Hamilton, banks wait in vain for technology to rescue their cellphone offerings. Their hopes for higher mobile usage for faster networks and device advances are misplaced on two counts.

- Improvements will not happen as quickly as firms hope.
- Inadequacies of their services go beyond immature technology.

Waiting for technology upgrades would mean putting wireless banking on hold for too long. Why should companies do this?

□ **Firms will wait until 2005 for GPRS to make an impact**

Device replacement cycles will delay the consumer adoption of high-speed wireless technology that firms hope will improve WAP service performance. Fewer cellphone users will have GPRS phones at the end of 2004. Therefore GPRS might not have the anticipated impact.

□ **Third-generation (3G) services will compound problems**

3G services on the Universal Telecommunications system (UTMS) will bring up to 16 times faster speed than that offered by GPRS, enabling propositions such as mobile video. But 3G will have teething problems, such as slow infrastructure upgrades, delaying services five years out. Organisations that wait now will continue to wait for the next advancements.

□ **New functionality will not make devices more mainstream**

Device manufactures add new functions like PDA features to smart phones, making them more clunky and costly, which is the opposite of what consumers seek. Each new generation of these devices will be restricted first to small circles of wealthy business users and computer experts, similar to today's elite of banking consumers using devices like the Nokia communicator.

2.12.2 Today's consumers need simpler services

By focusing on WAP transactions, banks ignore 90% of the users whose cellular phones are not WAP-enabled. Banks must set a new agenda for their wireless strategies. Banks must bridge the gap between the limitations of today's leading edge, but immature, WAP technology and future wireless

transactions by adopting today's mobile realities. Hamilton gives banks specific advises.

Brave the specificity of banking using a cellular phone

Most banks so far have simply extended web content to WAP, as a micro-version of today's PC-Web services. They have developed banking applications that stretch customers' patience with complex URL's that require 20 key presses and unwieldy navigation that demands eight clicks to display a bank account balance. Very few banks have built on mobile core properties, as a personal and timely device, by building simple balance inquiries or customised account alerts.

Grasp opportunities for simple service

Financial institutions have been obsessed with secure WAP transactions through an operator gateway for user authentication. Instead they should explore the many simple marketing or customer support services, such as SMS, that do not require high security standards. They should follow the example of First Direct, which attracted 115,000 SMS alert subscribers, more than one fifth of its online banking users.

Help customers up the learning curve

A year after network cellular providers launched mobile data services, early adopters like the youth and computer experts remain the only ones who invest time and effort into experimenting with SMS and WAP. Banks should expect mainstream customers to mature slowly on cellular, in the same way that Web users only tend to start banking online at least two years after they first try the Web. Banks, which wish to accelerate consumers' learning process, have to go further in educating them.

It is currently difficult for consumers to adopt the M-commerce services due to the factors such as poor user interface, security fears and costs. The

technology adoption lifecycle will be discussed in the next section to elaborate the process through which consumers have to go through so as to adopt a new technology.

2.13 The Technology Adoption Lifecycle

The market consists of innovators, early adopters, early majority, late majority and laggards. Innovators and early adopters, who are enthusiastic adopters of new technology, account for 16% of the market, which is not a sufficient number to ensure a new product or service will achieve a lasting success. Early adopters seek to implement new technology, before others gain competitive advantage. They are willing to accept the discontinuity between the old ways and the new caused by the introduction of the new technology as they are seeking a breakthrough, not continuous improvements (Moore, 1991:9). The early majority, which accounts for 34% of the market, consists of pragmatic people who are comfortable with technology. They wish to gain productivity improvements for their existing operations with the minimum amount of disruption. "They want evolution not revolution" (Moore, 1991:15). The early majority is concerned as to which standard will prevail as the industry standard or whether the new product or service will gain widespread adoption or not; that is, they face technological uncertainty (Porter, 1980:34).

Technological uncertainty raises the consumer's perception of the risks associated with purchasing the product or service (Porter, 1980). To overcome the technological uncertainty, the early majority relies on recommendations from other members of this group in adopting a product or service. However, as the new technology has not received widespread acceptance, the early majority does not receive any such recommendations. Moreover, as the early adopters and early majority have different profiles, the early majority does not accept recommendations from early adopters. The discontinuity in product or service acceptance between the early adopters and early majority is known as the 'chasm' (Moore, 1991:22).

The M-commerce technology uncertainty have been experienced in Europe and the United States of America, due that this a new technology still requires maturity. Tan and Teo (2000) developed an Internet technology adoption framework, and this framework will be adapted to the M-commerce technology.

2.14 M-commerce: Cellphone Banking Adoption Framework

Tan and Teo (2000) developed and tested a framework, which identified factors that may influence the adoption of Internet banking. These factors are defined below, with those that were shown empirically to influence adoption in Italics.

Relative Advantage

This is the extent to which a person views an innovation as offering an advantage over previous ways of performing the same task (Taylor & Todd, 1995).

Compatibility

This is the degree to which an innovation is viewed as being consistent with the existing values of users (Agarwal & Prasad, 1997).

Complexity

This is the degree to which an innovation is considered relatively difficult to understand and use (Taylor & Todd, 1995).

Trialability

This is the extent to which users would like an opportunity to experiment with the innovation prior to committing to its usage (Agarwal & Prasad, 1997).

Banking needs

This is the variety of banking products and services required by an individual (Tan & Teo, 2000).

Risk

This is the perceived sense of risk concerning disclosure of personal and financial information (Tan & Teo, 2000).

Internet Experience

This means prior experience of using a similar class or type of technology (Tan & Teo, 2000).

Subjective Norm

This refers to a person's perception that most people who are important think that he/she should perform a behaviour (Tan & Teo, 2000).

Mobile commerce may be regarded as an extension of electronic commerce, thus cellphone banking is also considered to be an extension of Internet banking, but with unique characteristics, given that a cellphone is used, rather than a web browser on a personal computer. Thus, a similar set of factors can be derived for cellphone banking by using this framework as basis. Relevant factors from the above list, which may apply equally to mobile commerce adoption, include Relative Advantage, Compatibility, Trialability, Banking needs, Risk and Self-efficacy.

Rather than Internet experience, however, cellphone experience would be relevant. Subjective Norm did not influence Internet Banking in the Tan and Teo (2000) study, and it is not expected to influence mobile commerce adoption, given the relatively private nature of banking in general. Government support for Internet commerce is also not directly related to cellphone banking, but an equivalent construct could be government support

for mobile commerce. Its effect on adoption may be contingent on government policy within a particular country (King et al., 1994), and also will not be considered in this study.

2.15 Conclusion

A number of studies have been conducted internationally regarding mobile banking solutions. Europe is generally believed to be the leader in developing M-commerce solutions and is setting a trend for other countries. In South Africa M-commerce is believed to be picking up as new solutions are being introduced. Four big banks in South Africa offer the cellphone banking service with Standard Bank leading with the customer adoption rate. Banks are putting in strategies to increase the customer adoption rate of the service.

Chapter 3: Research Methodology

3.1 Introduction

The research aspect of the study included both quantitative and qualitative research methods. It consisted of the survey questionnaire and interviews. The quantitative research sought to establish factors contributing to the failure to adopt cellphone banking and factors that can contribute to adoption thereof. Descriptive and inferential statistical procedures were employed to analyse the data gathered from respondents. The qualitative research sought to establish the reasons behind the introduction of the cellphone banking by Standard Bank and the banks future plans for the service.

3.2 Quantitative Research Methodology

The study is an empirical investigation by means of a questionnaire undertaken amongst Standard Bank customers. In order to answer the research question, a two-phased approach was adopted. A pilot study was undertaken to establish whether a questionnaire covers the relevant issues and is easily understandable. Then, the main study was undertaken to collect the data required for analysis.

3.2.1 Sampling

Sampling consists of selecting a certain number of people out of the identified population to participate in a study. There are two broad types of sampling and these are non-probability and probability samples. Probability sampling ensures that each member of a population is given a known non-zero chance of being included. Probability sampling ensures that each member does not have a known non-zero chance of being included (Cooper & Emory, 1999).

Each type of sampling has five main techniques associated with it. For probability sampling these are; simple random, systematic, stratified random,

cluster and multi-stage. Non-probability techniques include; quota, purposive, snowball, self-selection and convenience.

The method of collecting data was through convenience. The sample population for the study was any Standard Bank customer who uses or is familiar with cellphones as well banking facilities. Thus, the potential population was at the very most the five million Standard Bank customers. However, not all of them would be cellphone subscribers. Given the exploratory nature of this study, convenience sampling was employed.

In total, there were 50 respondents. Many other Standard Bank customers were approached but declined to participate, claiming that they did not know enough about the topic. Thus the respondents were those who had some idea of the concept of cellphone banking, even if they had never used the service before. This is important as lack of awareness of this technology often means that it is wrongly assumed to be no different to the Telephone Banking service. The respondents' demographic profile is displayed in Table 3.1.

Most respondents were between 20 and 35 (62%). The gender distribution of the respondents was approximately equal, with 46% being male and 54% female. 30% of the respondents were university/college graduates, whilst 18% had some secondary education. A significant number also had secondary education qualification (24%), thus in all representing a reasonably educated group.

The employment status data reveals that most of the respondents are employed (28%), while a significant number attend university part-time. 32% earn R5 000 monthly, with about 20% of respondents earning above R5 000.

Table 3.1 Respondents' demographic profile:

	Count	%
Gender		
Male	23	46
Female	27	54
Age		
Under 20	1	0.2
20-35	31	62
35-50	12	24
50+	6	12
Education		
Some secondary	10	18
Secondary certificate	12	24
Studying at tertiary level	5	0.8
University /college education	15	30
Masters degree	7	14
Doctorate	1	0.2
Employment Status		
Employed	28	56
Part-time student	8	16
Full-time student	2	0.4
Retrenched	6	12
Unemployed	4	0.8
Retired	1	0.2
Other	1	0.2
Monthly Income		
R0-R2500	11	22
R2501- R5000	16	32
R5001-R7500	10	20
R7501 – R10000	6	12
R10001 – R20000	4	0.8
R20001+	3	0.6

The respondents' profile represents a fairly young, educated group, either employed, studying or both. It is reasonably expected such a profile, as it is fairly young and educated and technologically savvy, and who would have an awareness of an innovation such as cellphone banking. Furthermore, it is mainly those who are employed and are earning a salary, or who are studying and anticipate earning a salary who would be concerned with banking and its various alternatives, such as cellphone banking.

3.2.2 Data Collection Method

Data was primarily gathered by visiting a number of Standard Bank branches where more than likely Standard Bank customers with cellphones would be found. Some online questionnaires were sent out to the existing Internet banking customer base, in order to extend the geographic profile of the sample. 75% of the responses were from the Gauteng province, because only Gauteng Standard Bank branches were visited.

3.2.3 Research Questionnaire Design

A research questionnaire was developed to gather the required data. It was divided into four sections, as described below.

Section A: Demographic profile

This section was aimed at obtaining demographic data about the respondents, which includes age, gender, education, income and employment status.

Section B: Cellphone Banking Usage

This section was aimed at gathering information relating to the respondents' cellphone usage, as well as to gauge respondents' understanding of the

technologies involved with cellphones, such as WIG and WAP. It also, included a measure of cellphone experience, which was determined by aggregating the number of uses to which a respondent applied their cellphone, that is making and receiving calls, sending and receiving an SMS, a calculator and playing games.

Section C: Banking

This section asked questions to establish whether the respondent banked with Standard Bank, the products and services used, and the extent to which they used various banking direct channels, such as ATMs, telephone, Internet, cellphones and branches.

Section D: Cellphone Banking Adoption and factors of influence

This section related to whether respondents actually used or intended to use cellphone banking, and what factors influenced or were likely to influence their usage in this regard. A five-point Likert scale was used to measure the independent variables in this section, except for Banking Needs. This was measured by counting the number of banking services a respondent would use, if they had a cellphone with the capabilities of performing banking transactions. Three to four items were used to measure each of the other constructs, these being derived from the definitions for the constructs outlined in Chapter 2, and from previous measures, such as in Tan and Teo (2000), and Taylor and Todd (1995). Items were worded so as to be relevant to cellphone banking, and to be easily understood in a broad South African context.

A copy of the questionnaire is attached in Appendix II.

3.2.4 Pilot Study

A pilot study was undertaken using an array of people, which included a marketing specialist, an actuarial assistant, an Information Systems

employee, a finance employee and an administration employee. Such a diverse group was chosen, as cellphone users are many and diverse. The main purpose of the pilot study was to ensure that the questionnaire addressed the relevant issues, that it was easy to understand, and that it had been professionally compiled. The participants were asked to fill in the questionnaire, and add any other comments on how the questionnaire could be improved.

Once the pilot study was completed and the questionnaire was redesigned to include the comments from the participants, the statistical procedure to be employed for data analysis were decided upon.

3.3. Statistical Analysis Methods

Both descriptive and inferential statistical procures were employed to analyse the data collected from the respondents. The initial activity in data analysis consisted of data preparation, including data editing, data coding and data entry. The objective is to ensure the accuracy of data and its conversion from raw form to reduced and classical forms that are more appropriate to analysis. Preparation of a descriptive statistical summary is the preliminary step leading to the understanding of the collected data.

3.3.1 Descriptive Statistics

Descriptive statistics is a statistical analysis method used to describe the empirical data. This method will be used to summarise what was found in the empirical data. This concerns the average and the variability of a set of data and those that describe the degree of relationship between two variables. The descriptive statistical techniques employed are the following:

(a) Measures of central tendency

This is a single number that is used to represent the average score in the distribution. It includes;

- Mean – the average of the scores.
- Median – the midpoint of the distribution.
- Mode – the most frequently occurring value.

(b) Measures of variability

The common measures of spread, alternatively referred to as variability or dispersion describe how scores cluster or scatter in a distribution. These include;

- Variance - the average of the squared deviation scores from the distribution's mean. It is the measure of the score dispersion about the mean.
- Standard deviation – summarises how far away from the average the data values typically are.
- Range – is the difference between the largest and smallest score in the distribution.

3.3.2 Inferential Statistics

This method consists of employing statistical techniques that allow the drawing of inferences about the population from the sample drawn from the population. The purpose of hypothesis testing techniques is to determine the accuracy of the six hypotheses formulated in chapter 1 of the study. The hypotheses were tested using multiple linear regression analysis, including;

(a) Correlation analysis

Correlation measures the strength of the relationship between variables. It also reveals the magnitude and direction of variables relationships. Variables to be measured are:

- Cellphone banking and risk/security
- Cellphone banking and relative advantage
- Cellphone banking and trialability

- Cellphone banking and complexity
- Cellphone banking and compatibility
- Cellphone Banking and banking needs

The empirical data will be described using the above techniques to determine the significance of the hypotheses.

(b) Frequency analysis

This is a technique used to display data in an ordered list of values. Frequency tables showing the number of responses to each answer will be displayed.

3.3.3 Constructs Reliability

To test the reliability of each multiple-item construct that form part of the instrument, Cronbach's alpha was used. Using a cut-off alpha value of 0.6 or higher as an indicator of reliability (as in Tan & Teo, 2000), it was found that such constructs could be viewed as reliable.

3.3.4 Constructs Validity

Factor analysis with varimax rotation was used to confirm the validity of each of the constructs with multiple-item measures. Since there were seven of these, a seven-factor structure was suggested, with an eight eigen value of 1. Items for Relative Advantage, Compatibility, Trialability and banking needs loaded at greater than 0.4 on their respective factors and are thus deemed valid (as in Tan & Teo, 2000). However, Complexity and Risk both loaded on the same factor. Correlation analysis reveals that these are still distinct constructs, as the coefficient between them is only 0.48. This finding does demonstrate, however that Complexity and Risk are closely linked in the minds of respondents, especially for innovations such as cellphone banking

where many people have not yet had the actual experience of using such a service.

3.4 Qualitative Research Methodology

Standard Bank's M-commerce management team was interviewed using semi-structured questions to establish answers to various questions. The questions asked are the following:

Question 1

Why did Standard Bank launch cellphone banking service in the past 4 years?

Question 2

Why are customers not adopting the cellphone banking service?

Question 3

What are your views on the maturity/immaturity of the technology?

Question 4

What are Standard Bank's M-commerce future plans?

3.5 Conclusion

The study research methodology consisted of both the Quantitative (descriptive and inferential) and qualitative research statistical methods. A questionnaire was developed for the purpose of collecting the required data for analysis. A pilot study was conducted to validate that the questionnaire addresses the relevant issues. The sampling technique used was a convenience sampling, and every Standard Bank customer had an opportunity to be selected.

The data collection method consisted of visiting the Standard Bank branches where customers were asked to complete the research questionnaire. The data collected was analysed using the identified descriptive and inferential statistical procedures. Research results are presented next.

CHAPTER 4: REPORTING AND DISCUSSION OF RESULTS

4.1 Introduction

The purpose of this chapter is to present the results of the empirical research, which was designed to do the following:

- Identify the factors that contribute to the non-adoption of cellphone banking by customers
- Identify factors that can increase the service adoption, and therefore assist the banks in promoting the service to critical mass
- Establish the future of m-commerce in the banking industry.

Both the Quantitative and qualitative research results will be presented.

4.2 Quantitative Research Methodology

Research results will be presented according to the descriptive and inferential statistical procedures discussed in chapter 3.

4.2.1 Descriptive statistical results

Descriptive statistical results are presented in table 4.1. The scores reveal that most respondents' perceive cellphone banking to be risky and the security may be compromised. They see the cellphone banking service as service that will provide some level of convenience if utilised for banking and also is a quick service to use compared to the other forms of banking like Internet or telephone banking.

Table 4.1: Descriptive Statistical Results

	<i>Cell_complex</i>	<i>Cell_mental effort</i>	<i>Cell_frustrating</i>	<i>Cell_risky</i>	<i>Cell_security</i>	<i>Cell_tampered with</i>	<i>Cell_advantageous</i>	<i>Cell_convenient</i>	<i>Cell_fin_manage</i>	<i>Cell_quick</i>
Mean	2.66	2.82	2.40	2.94	3.84	2.82	2.68	4.02	2.78	4.12
Standard Error	0.17	0.17	0.12	0.15	0.10	0.12	0.14	0.10	0.12	0.11
Median	2.00	2.00	2.00	3.00	4.00	3.00	2.00	4.00	3.00	4.00
Mode	2.00	2.00	2.00	4.00	4.00	2.00	2.00	4.00	2.00	4.00
Standard Deviation	1.17	1.19	0.88	1.04	0.71	0.83	0.96	0.68	0.84	0.75
Sample Variance	1.37	1.42	0.78	1.08	0.50	0.68	0.92	0.47	0.71	0.56
Kurtosis	-1.21	-1.39	2.02	-1.24	2.75	-1.06	-1.46	3.14	-1.45	2.18
Skewness	0.39	0.06	1.72	-0.10	-1.54	0.13	0.55	-1.22	0.44	-1.12
Range	4.00	4.00	4.00	4.00	3.00	3.00	3.00	3.00	2.00	3.00
Minimum	1.00	1.00	1.00	1.00	2.00	1.00	1.00	2.00	2.00	2.00
Maximum	5.00	5.00	5.00	5.00	5.00	4.00	4.00	5.00	4.00	5.00
Sum	133.00	141.00	120.00	147.00	192.00	141.00	134.00	201.00	139.00	206.00
Count	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00

Descriptive Statistics scores on general cellphone usage and cellphone banking in Table 4.2, reveal that 88% of respondents own a cellphone, but only 26 % have ever used cellphone banking, consistent with findings in other countries (ePaynews.com, 2002). Seventy four percent indicated their intention to use cellphone banking, 0.6% have no such intention. A large percentage was uncertain as to whether they would use cellphone banking or not (20 %).

The mean scores for factors that may influence cellphone banking adoption were compared between those who had used it, and those who had not. The cellphone banking users who used a significantly higher number of cellphone functions, perceived the risk to be significantly lower and saw a greater need for facilitating conditions than did those who had not used cellphone banking before.

Table 4.2: Cellphones ownership vs. cellphone banking usage

	Total: n = 50	%
Cellphone Ownership		
Yes	44	88
No	6	12
Intentions to use cellphone banking		
Yes	37	74
Uncertain	10	20
No	3	0.6
Users of cellphone banking		
Yes	13	26
No	37	74

The descriptive statistics scores on banking habits of respondents are shown in Table 4.3. Most respondents bank a few times a month or more (78%). In terms of number of bank accounts used, the majority has only one or two (77%). The most popular accounts are the savings account followed by a current account. The ATM is the most popular channel for banking, while telephone banking, Internet banking and cellphone banking are not used to a great extent.

Table 4.3: Banking frequency vs. banking channel used

Frequency of Banking				
	Count	%		
	Total: n = 50			
Daily	2	0.4		
Few times per week	4	0.8		
Weekly	11	22		
Few times per month	26	52		
Seldom	7	14		
Number of Bank Accounts/ Services used				
0	0	0.0		
1	21	42		
2	14	28		
3	7	14		
4	8	16		
Extent of Channel Use (1-never, 6-Daily)				
	Mean	Minimum	Maximum	Std. Dev.
Branch	2.4	1	6	1.4
ATM	3.6	1	6	1.3
Telephone	1.6	1	6	1.5
Internet	1.6	1	6	1.3
Point of Sale	2.1	1	6	1.7
cellphone	1.6	1	6	1.5

* Missing values replaced with 1

4.2.2 Inferential Statistical Results

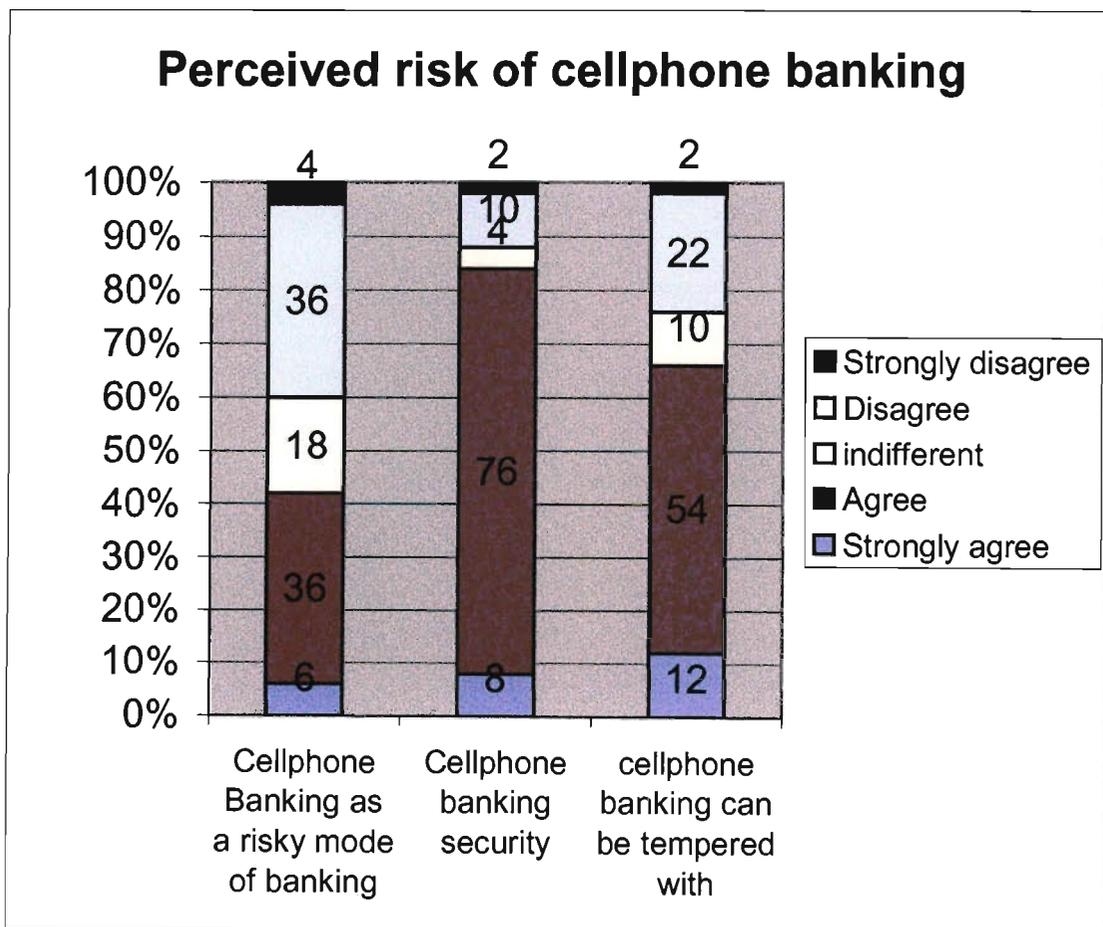
The research results are presented according to the inferential statistics discussed in chapter 3. These techniques were used to test the six hypotheses formulated in chapter 1 of the study. The significance of each hypothesis will also be proven.

4.2.2.1 Frequency Analysis

There was support for four out of the six hypotheses formulated. This is as set out below.

H7: The greater the perceived risk of using cellphone banking, the less likely that it will be adopted.

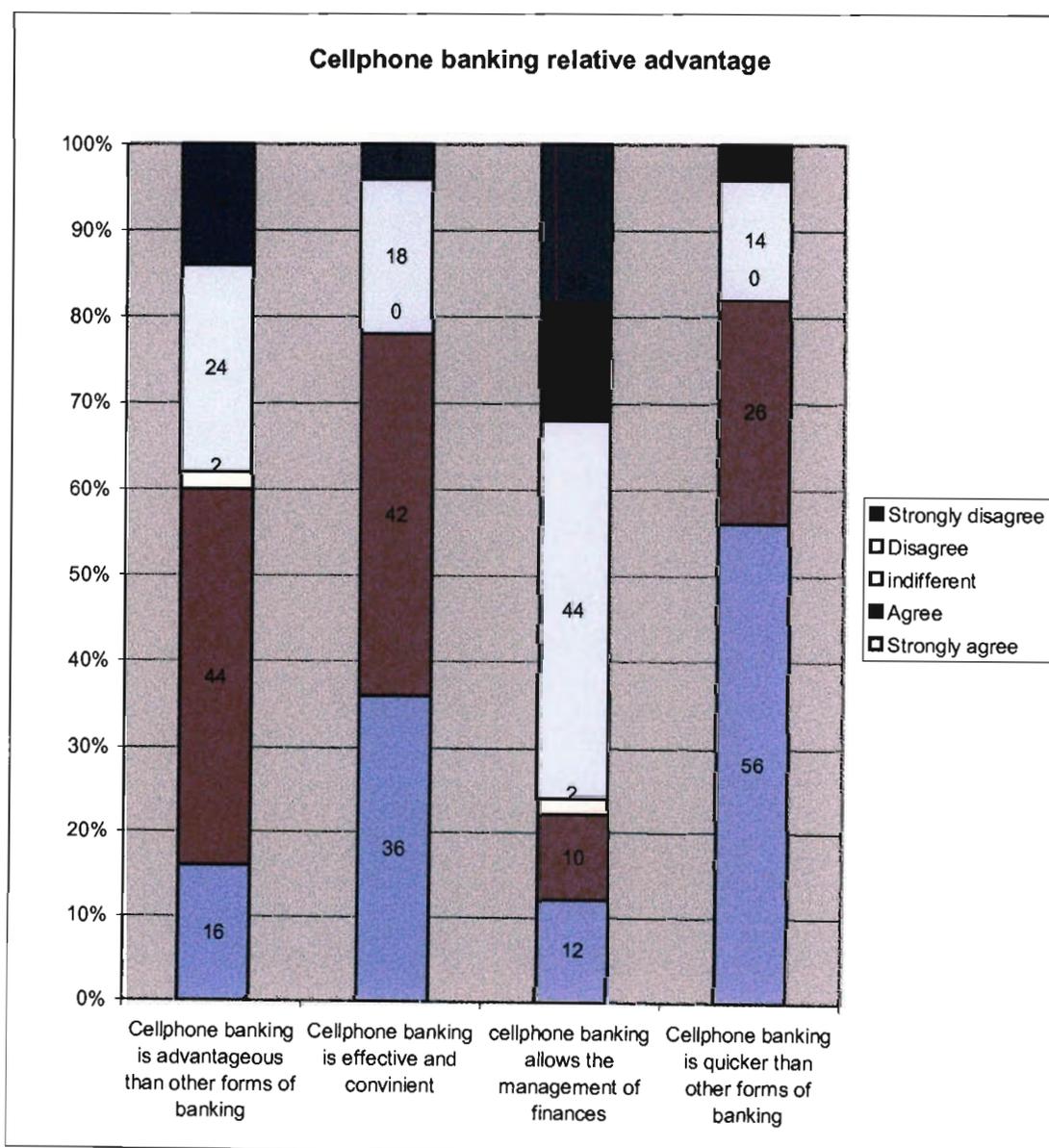
Figure 4.1: Perceived risk of cellphone Banking



The graph illustrates the level of cellphone banking perceived risk by customers. 76 % of respondents are concerned about the security of the cellphone banking service and 54 % believe that someone else can temper with their banking when they use the cellphone banking. It is important that the risk levels are addressed, so that the service adoption can increase.

H1: The greater the perceived Relative Advantage of using cellphone banking, the more likely that it is adopted.

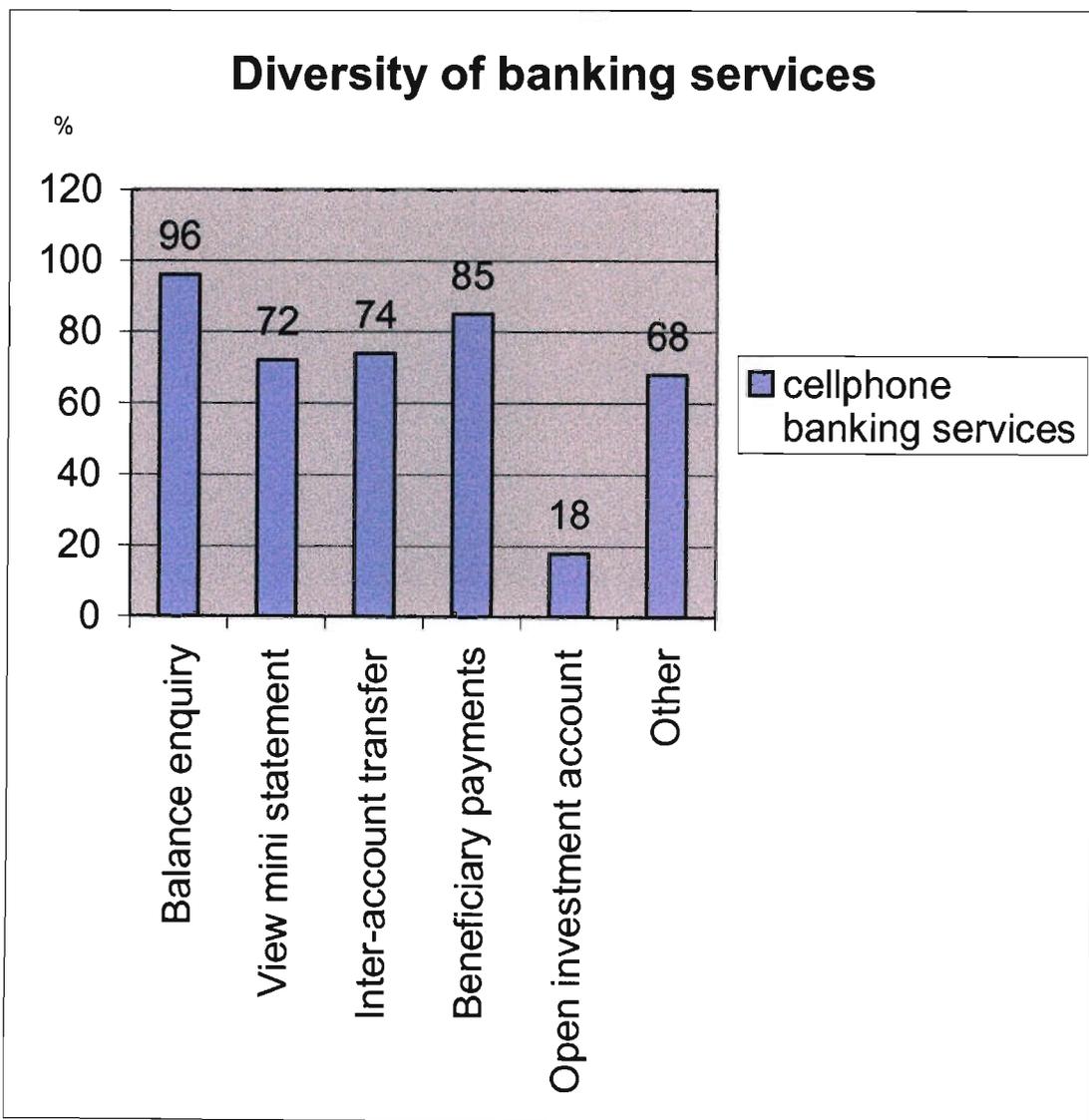
Figure 4.2: Cellphone banking relative advantage



Illustrated in the graph are the percentages of respondents that regard the relative advantage of cellphone banking as a positive factor that likely to increase the adoption of cellphone banking. The more advantageous the cellphone banking is regarded, the more likely that the adoption will increase.

H6: The greater that diversity of banking services and products required, the more likely it is that cellphone banking will be adopted.

Figure 4.3: Diversity of banking service



The graph indicates the types of transactions that customers would like to perform when using the cellphone banking service. Therefore the more diverse the banking services are, the more likely that cellphone banking will be adopted.

H4: The greater the Trialability relative to mobile commerce the more likely that it is adopted.

Only 11 respondents out of the total of 50 interviewed use the Standard Bank cellphone banking service. Respondents who do not use the service were asked to indicate if they will use the service in future, and 66% have shown interest to use the service should they be given an opportunity to try the service. These variables accounted for 66% of the variance in intentions to use cellphone banking in the future.

Table 4.4: Cellphone Banking Trialability

	Frequency	Percentage	Valid	Cumulative Percentage
Valid				
Strongly disagree	2	4.0	4.0	4.0
Disagree	9	18.0	18.0	28.7
Indifferent	1	2.0	2.0	43.4
Agree	22	44.0	44.0	72.0
Strongly agree	16	32.0	32.0	100.0
Total	50	100.0	100.0	

4.2.2.2 Correlation analysis

The purpose of the correlation analysis is to reveal the magnitude and direction of relationship between different variables or factors. The magnitude of the relationship refers to the degree to which variables move in unison or opposition. The direction shows whether large values on one variable are associated with large values on other variables. In this particular case, correlation was used to test the significance of hypotheses and identify correlations between different factors that are being investigated.

The correlation results are tabled in Appendix III. The results reveal the following positive and inverse correlations.

Positive Correlations:

- Cellphone banking and risk/security
- Cellphone banking and relative advantage
- Cellphone banking and trialability

Inverse correlations:

- Cellphone banking and complexity
- Cellphone banking and compatibility

The reasons for these correlations are that these are not always obvious and always provide a deeper understanding of the research study being conducted.

4.4 Qualitative Research Methodology

Standard Bank's M-commerce management team was interviewed using semi-structured questions to establish answers to various questions. The responses to the questions asked are presented below:

Question 1

Why did Standard bank launch the cellphone banking service in the past 4 years?

Nearly two-thirds said that they aimed to give customers an additional access point for their finances as part of their multi-channel strategies.

“The industry as a whole had high hopes for m-commerce. It was another access point. It was an implicit part of the ‘anything, anywhere’ channel strategy. When there was a new channel, we wanted to deploy our services on it.”

“One of the additional benefits of wireless transactions is that they are cheaper for us to process, taking costs out of branches and the call centre.”

“When we launched our cellphone banking service, our share price rose more than 10 % in a day. We did it to put us in analysts’ psyche as pro-technology.”

Question 2

- ***Why are the customers not signing up for the cellphone banking service?***

The majority of the interviewees report that cellphone banking service failed to meet their expectations. Of the five million customer base, and probably 75 % with cellphones, only 30 000 have signed up for the service. When Standard Bank measures the usage it has not met the expected targets. Standard Bank says that the device’s complexity and the lack of content on the platform discourage their users.

“Consumers are just not interested in m-commerce at the moment. It is still only tech geeks using it---we need to market cellphone banking to cellphone users.”

“I don’t think that costs are stopping customers. Banking today is much easier to do on the phone, speaking to an agent, than through a complex cellphone

device. The only time our customers use m-commerce offerings is to receive cricket scores.”

“We don’t have enough cellphone banking users to justify the costs. There are only a couple of thousand users ---not like the hundreds of thousands of Internet banking users. Some international banks have stopped providing services because customers aren’t there.”

Question 3

What are your views on the maturity/immaturity of the technology?

Interviewees believed that the biggest challenge lay in overcoming immature technology. They blamed operators for erratic network connections and criticised handset manufactures for creating inconvenient devices.

“The problem with some of the handsets is that they are not WAP enabled cellphones. The gateway crashes every two minutes because the software is unstable, so the customer experience was terrible from the start.”

“The key issue is customer usability. These small keypads require too much fiddling with. I see customers struggling with their tiny devices trying to get an order through. There must be a more clever way around it.”

Question 4

What are Standard Bank's M-commerce future plans?

Standard bank is taking a conservative approach to developing and marketing mobile banking services while it waits for technology to mature and for consumers to catch up with the technology.

“GPRS will work quite well, when we get it. When cellphones and PDA’s ultimately come together as one device, we will have real mobile offerings.”

“We’ve been caught up in the hype before, spending 3.2 million on the cellphone banking development alone. Although it’s a useful learning curve, we will have to wait to see how the wireless technology and WAP develop.”

Qualitative research analysis findings:

The interviews held with the Standard Bank M-commerce management revealed the following:

- Cellphone Banking was launched for channel extension.
 - Standard Bank broadened their electronic banking channels with WIG and WAP cellphone banking.

- Management blamed low take up on wireless technology shortcomings
 - They complain about poor connections and difficult to use devices and that the technology is still in its immature stages.

- Standard Bank await wireless technology developments like GPRS and UMTS.
 - Standard Bank freezes its wireless initiatives hoping technology will bail them out.

4.4 Conclusion

It is clear from the research findings that cellphone banking has not been widely adopted, despite the rapid diffusion of cellphones in South Africa and the popularity of cellphone functionality such as SMS. Factors that can influence the adoption of the cellphone banking service are relative advantage, trialability and diversity in banking needs. Conclusions and recommendations will be discussed in the following section.

Chapter 5: Conclusions and Recommendations

5.1 Introduction

This chapter revisits the objectives of the study and briefly describes how they were achieved. The possible benefits of the study to the business are described, recommendations are made and finally, the summary of outcomes is made.

5.2 Outcomes of the research

Numerous efforts have been undertaken at Standard Bank to promote the service to customers, such as offering the service free of charge. Factors likely to influence the non-adoption of the cellphone banking service are high-perceived risk and the security of the technology. Factors likely to influence adoption includes trialability, relative advantage, and the customer need for banking services from a cellphone and lower perceptions of technology risk.

Thus, these areas should be the focus of Standard Bank efforts to promote the use of cellphone banking. Customers need to be made more aware of what advantages cellphone banking offers over other electronic banking channels, such Internet banking, telephone banking and ATMs. There also need to be opportunities for customers to try and test cellphone banking, and even see demonstrations of how this service works. The service activation should also be carried out very easily and quickly for customers, without any inconvenience to them. This will raise awareness, and give customers a greater understanding of the technology.

Those who foresee themselves using a wide range of services through cellphone banking are also more likely to adopt it, so services being offered should be widely advertised, with such people being the initial target market. It is also imperative that a customer value proposition is also mapped out so, that the benefit to the customer is made clear. Perception of risk, as with

many new technologies, needs to be addressed, as does customer education, as the lack of this causes a major impediment to cellphone banking adoption.

Compatibility, complexity and cellphone experience did not show any influence on cellphone banking adoption. This may be due to the fact that very few people have actually used the service, and thus may not be able to develop unambiguous perceptions of whether this technology would be compatible with their lifestyle, whether facilitated support for its use would be necessary, whether they would have the confidence to use it, and whether it would be difficult to use it. These may be factors that are relevant after actual initial usage and experimentation with the technology.

At present there appears to be uncertainty within Standard Bank with regards to customers adopting the existing cellphone banking service and adapting the service to the greater bandwidth offered by GPRS and UMTS. The bank is uncertain as to how their offering will develop beyond GSM-based WAP and WIG at the moment, and it would seem that the majority of whom favour a 'wait and see' approach, at least for the time being, especially since the availability and functionality of supporting handsets is very uncertain. It is clear that the potential offered by the next generation wireless technologies offers enormous potential for all those involved in M-commerce.

The short-term priority for Standard Bank will undoubtedly be to tailor their services effectively to the higher bandwidth and better adapted handsets that will in time be available. However, once this has been done and reliable offerings have been rolled out with full transactional capability, services such as viewing account balances on a single screen and an ability to pay accounts at a touch of a button, it seems clear that these will come to form a key part of cellphone banking in due course.

5.3 Recommendations

Standard Bank must consider certain factors in terms of promoting the cellphone banking offering to the market.

5.3.1 Service Standards

Once cellphone banking grasps hold of a sizeable market, the major challenge facing the Standard Bank will be to offer services that enable the company to differentiate its self in the market.

The banks, which perfect the art of mass customisation, will be the winners. This involves learning about individual customers in order to provide them with their personalised requirements and doing this in a fully automated fashion for each customer.

Banks with some innovative companies are already offering these services on their web sites by allowing personalised web pages. Although this is a major step forward, the problem is that customers have to customise these for themselves manually configuring the website and content selection. Standard Bank should know its individual customer's wants and customise and tailor the information for them accordingly.

5.3.2 Business Intelligence

To carry out mass customisation, Standard Bank needs to use business intelligence technologies, based upon historical and predictive analytical analysis.

Basically, business intelligence tools can be used to examine the history of existing customers, and produce profiles of these customers. Banks can for example, track how a new customer weaves his/her way through the web pages. They can then note the manner in which the new customer browses, and can compare this pattern with known customer patterns in order to

deduce a profile enabling the bank to make predictions around the customers' interests.

Business intelligence tools can quickly build up a picture of a customer from all different touch points, resulting in 360-degree customer view. This understanding can be used to customise interactions with customers in order to target a specific message to them.

In depth understanding of both existing and potential customer is absolutely crucial and can only come about through the use of technologies such as business and artificial intelligence.

5.3.3 Information differentiation

Information becomes an irritant if it is unsolicited and inappropriate. However, if it is meaningful and desired, customers, look forward to receiving it. The key to success is not how often the bank communicates with the customers, but how deeply it understands them and how meaningful the message is.

Mass customisation, combined with cellphone banking, will result in a win-win situation for Standard Banks and its customers. In the future, it could also be possible to store information with cellphone service providers, emulating the storage facility of a smartcard, which will add even more e-value to the cellphone banking service. Cellphones and PDAs have moved closer together, but only a very small percentage of South African population will go the PDA route, as PDA manufactures will still tend to target the more affluent market. This too could change as prices drop and functionality increases, enabling a PDA to become a cellphone.

5.4 Summary

Cellphone will remain the communications medium of choice in South Africa, because of its acceptance and usage across the population. Due to that the M-commerce technology is new in South Africa, further studies need to be

undertaken to determine the best possible way to increase its adoption the market. These include consumer education about the technology and the cellphone service. Therefore, Standard Bank has to make use of this opportunity to extend banking services to the masses in South Africa.

REFERENCES

Adrian B (2001). *Wireless Retail Banking Adoption in the United States*. Gartner Research, United States.

Agarwal R and Prasad, J (1998). *The role of innovation characteristics and perceived voluntariness in the acceptance of information technologies*. *Decision Sciences*. 28(3), 18-23.

Attwood R and Duncan S. (2000). *Mobile Commerce: Strategies for new business paradigm*. FT Telecoms. London.

Barnett N, Hodges S and Wilshire MJ. (2001) *M-commerce: An operator's manual*. McKinsey Quarterly, Number 3, 48-51.

Birch G (1999) *Mobile Financial Services: The Internet isn't the only digital channel to consumers*, *Journal of Internet Banking and Commerce* (4) 1, pages 13-16.

Cooper D. R & Emory C.W. (1999) *Business Research Methods*. Richard D Irwin. United States.

Ensor B. (2002) *Who's Banking on Cellular Phones?* Technographics, Consumer Technographics Europe.

Essex W. (2000), *Strategic Focus on M-commerce in Banking*, Informa Publishing group. London.

Goldstuck A. (2002). *The Goldstuck Report: Internet Access in South Africa*.

Hamel G and Prahalad C.K. (1994) *Competing for the future*. Harvard Business School Press.

Lefebvre P. (2001). *Mobile Banking in Europe*. DG Information Society. European Commission.

Levin J and Wolfenden R. (2000). *M-Commerce: An analysis of South African scenarios from the perspective of the mobile operators – 1999-2004*. The Graduate School of Business. University of Cape Town. Cape Town.

Manson H. (2002). *Driving home value to banking customers*, Journal of Convergence, (2) 5, 22-27.

Reuters Business Insight survey. (2001) *Mobile Banking in Europe*. England

Taylor S. and Todd P. (1998) *Understanding information technology usage: A test of competing models*. Information Systems Research. 6(2), 33-38.

Zizke A (2002) Is cellphone banking the way forward? Network Times. Technews. London.

Internet 1: http://www.cellar.co.za/stats/statistics_south_africa.htm

Internet 2: <http://www.epayments.com/statistics/mcomstats.html>

Internet 3: www.mobileresearchonline.co.uk

Internet 4: <http://standardbank.co.za/site/cellphone/WigOverview.html>.

BIBLIOGRAPHY

BMI-techKnowledge Group (2002). *Communication technologies: Handbook*.

Brown I, Cajee Z, Davies D, Stroebel S. (2003) *Cellphone Banking: Predictors of Adoption in South Africa*. University of Cape Town. Cape Town.

Department of Communications (2003) *South African Wireless*, Volume 7(6), 9-18.

Rupp T. W and Smith D. A. (2002) *Mobile Commerce: New revenue machine or black hole*. Business Horizons, Pennsylvania.

Technews (2004) *e-strategy: mobile commerce special publication (1st Ed)*. New York, USA,

Thompson A.A. & Strickland A.J. (2001). *Crafting and Executing Strategy, Text and Readings (12th Ed)*, McGraw-Hill Irwin, New York.

APPENDICES

Appendix I: Glossary of terms

3G – Third Generation

ATM – Automated Teller Machine

Cellphone/Mobile Banking – Electronic banking service offered to customers via a cellular phone

E-commerce – Electronic Commerce

E-Banking – Electronic Banking

GMCF – Global Mobile Commerce Forum

GPRS – General Packet Radio Switch

M -commerce – Mobile Commerce

PDA – Personal Digital Assistance

S.A. – South Africa

SIM – Subscriber Identity Module

SME – Small Medium and Enterprise

SMS – Short Message Service

USSD – Unstructured Supplementary Service Data

WIG – Wireless Internet Gateway

WAP – Wireless Application Protocol

Appendix II: Research Questionnaire:

Section A: Biographical Details

Age group:

Under 18		18-25		26- 30		31-35		36- 40		41- 50		50+	
-------------	--	-------	--	-----------	--	-------	--	-----------	--	-----------	--	-----	--

Gender:

Male		Female	
------	--	--------	--

Highest level of education: (Please mark the highest level reached)

Some high school		Matric (Grade 12)		Some tertiary education	
University/college graduate		Masters		Doctorate	

Current employment status:

Employed		Part-time student		Full-time student	
Retrenched		Retired		Unemployed	

Monthly Income

R0-R2500		R2501- R5000		R5001-R7500	
R7501 – R10000		R10001 – R20000		R20001+	

Section B: Cellphone

Do you have a cellphone?

Yes		No	
-----	--	----	--

What do you use your cellphone for (Mark all that apply)

To receive calls	<input type="checkbox"/>	To make calls	<input type="checkbox"/>	SMS	<input type="checkbox"/>	Accessing Internet	<input type="checkbox"/>
Banking	<input type="checkbox"/>	Playing games	<input type="checkbox"/>	Calculator	<input type="checkbox"/>	Other	<input type="checkbox"/>

Do you have a WAP-enabled cellphone?

Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	Unsure	<input type="checkbox"/>
-----	--------------------------	----	--------------------------	--------	--------------------------

Do you have a 32K – SIM card?

Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	Unsure	<input type="checkbox"/>
-----	--------------------------	----	--------------------------	--------	--------------------------

Do you know what WAP is?

Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	Unsure	<input type="checkbox"/>
-----	--------------------------	----	--------------------------	--------	--------------------------

Do you know what WIG is?

Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	Unsure	<input type="checkbox"/>
-----	--------------------------	----	--------------------------	--------	--------------------------

Which technology do you think is better?

WAP	<input type="checkbox"/>	WIG	<input type="checkbox"/>	Unsure	<input type="checkbox"/>
-----	--------------------------	-----	--------------------------	--------	--------------------------

Section C: Banking

Do you bank with Standard Bank?

Yes	<input type="checkbox"/>	No	<input type="checkbox"/>
-----	--------------------------	----	--------------------------

Which account do you hold with Standard Bank? (Mark all that apply)

Current/cheque account		Savings account		Eplan account	
Sum 1 account		Car/Home loan		Investment account	

How often do you bank?

Less than daily		Daily		Weekly	
Few times a month		Monthly		Seldom	

To what extent do you use the following to do your banking? (Mark all that apply)

	Less than daily	Daily	Weekly	Few times a month	Seldom	Never
Branch						
ATM						
Store/shop						
Telephone						
Internet						
Cellphone						

Section D: Cellphone Banking

Have you ever used a cellphone to do your banking?

Yes		No		Unsure	
-----	--	----	--	--------	--

If no, would you ever do your banking using a cellphone?

Yes		No		Unsure	
-----	--	----	--	--------	--

Complexity:

	Strongly disagree	Disagree	Indifferent	Agree	Strongly agree
Cellphone would be complex to use					
Cellphone banking would require a lot of mental effort					
Cellphone banking might be frustrating					

Risk:

	Strongly disagree	Disagree	Indifferent	Agree	Strongly agree
Cellphone banking is a risky mode of banking to use.					
I am concerned about the security					
Information concerning my cellphone banking transactions can be tampered with by others					

Relative Advantage:

	Strongly disagree	Disagree	Indifferent	Agree	Strongly agree
Cellphone banking is more advantageous than traditional forms of banking.					
Cellphone banking is more effective and					

convenient than traditional forms of banking.					
Cell banking would allow me to manage my finances more effectively.					
Cellphone banking is quicker to use than other forms of banking.					

Which services would you use if you did cellphone banking? (Mark all that apply)

Balance enquiry		View mini statements		Inter-account transfers	
Beneficiary payments		Open investment accounts		Other	

Appendix III

Correlations

	<i>Cell_complex</i>	<i>Cell_mental effort</i>	<i>Cell_frustrating</i>	<i>Cell_risky</i>	<i>Cell_security</i>	<i>Cell_tampered with</i>	<i>Cell_advantageous</i>	<i>Cell_convenient</i>	<i>Cell_fin_management</i>	<i>Cell_quick</i>
Cell_complex	1									
Cell_mental effort	0.701991135	1								
Cell_frustrating	0.411549694	0.2843439	1							
Cell_risky	0.402439616	0.3544976	0.2946340	1						
Cell_security	0.104995402	0.1825494	0.1370355	0.540202	1					
Cell_tampered with	0.230953688	0.2156934	0.3257039	0.511078	0.33280	1				
Cell_advantageous	-0.226487742	-	-0.159818	-	-0.46715	-	1			
Cell_convenient	-0.245783577	-	-	-	-0.11916	0.00649911	0.290211405	1		
Cell_fin_management	-0.077572869	0.0412402	-0.209657	-	0.17922	0.00058867	-0.292424368	-	1	
Cell_quick	-0.139179356	-0.0671187	-	-0.35933	-0.04005	-	0.026292944	0.154965	0.303445	1
			0.3540714			0.29559664		0.063144	0.303445	
								0.29559664	0.303445	