

The impact on organisational performance as a result of investment in self-service technology within the South African financial services industry

An Empirical Study presented to the Department of Information Systems
University of Cape Town



By

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Abstract

The advent of self-service technology (SST) and the adoption thereof has occurred in many industries and sectors globally. The financial services and banking sector embraced the SST transformation and invested heavily into this channel including the South African industry. This study aims to understand the causal relationship between the investment into the SST channel and the impact it has on organisational performance within the South African context.

This research exercise applied a single unit of analysis case study research strategy to examine the impact on the organisation's various performance criteria, namely profitability, productivity, cost efficiency and intangible benefits as a result of a SST investment strategy. Qualitative data was collected from interviews with key informants from the selected organisation and analysed thematically. The study adopted a theory based deductive approach using the DeLone and McLean model of IS success (2003) as its underlying research framework.

The findings of this study deduced that with an appropriate investment strategy in SSTs, there would be a positive impact on the net benefits of the organisation with an explicit relationship dynamic. This study lends support to earlier studies of this nature, particularly with regard to the SST channel offering, as there is a lack of literature due to the evolution of perception and recency of this technology channel. The relationship dynamic aspects between the constructs of this study also contributes to the closing of gaps within the body of knowledge that exists. However it must be noted that these findings are based on a single unit of analysis case study research strategy which connotes limitations in terms of generalisations.

Key words: banking sector, financial services sector, net benefits, organisational performance, self-service technology (SST).

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1. Introduction

1.1. Background and the problem statement

Brynjolfsson (1993) theorised the 'productivity paradox' that questions whether the investment in information systems would contribute to an organisation's profitability from a productivity perspective. This debate remains unresolved although there have been many attempts to both prove and disprove this theory.

Organisational investment into information technology has increased over the past few decades according to Michaels (2007) and there is a presumption that this investment would improve efficiencies as well as organisational performance (Hung, 2012). Based on the findings of these academics, there is a definite realisation that there is a need to firstly, invest in information technology and secondly, that information technology will improve efficiencies that will lead to organisational financial wellbeing.

With the advent of distributed computing, organisations seized upon the opportunity to find ways to service their clients electronically. This electronic servicing progressed at a rapid rate with the invention and adoption of the internet. Lee, Park, Chung & Blackeny (2012, p1590) highlighted that "advancements in internet technology are transforming the modern world ... since 1995, e-commerce, e-business and m-business (mobile business) has increased dramatically".

Electronic self-service facilities in the form of Automated Teller Machines (ATM), online internet access and transactional (also known as e-business) and mobile business (also known as m-business) gained prominence in the financial services sectors and have reduced in-bank transactions to 10% of total transactions according to Yang and Klassen (2008). These statistics supports the early sentiment expressed that the introduction of self-service technologies (SST) would have a positive effect on customer satisfaction, productivity and cost efficiency (Meuter & Roundtree (2003); Walker, Craig-Lees, Hecker and Francis, 2002; Zeithaml & Giller, 1987).

There is evidence that the investment into SSTs have reduced the level of manual intervention especially within the financial services sector. Considering these facts, it is not conclusively evident, from a performance perspective, how the investment into SST impacts the organisation as a whole.

Furthermore, Tam (1998) suggests that there may not be a relationship between improved productivity and organisational performance as any advantages or benefits derived will not necessarily be associated with the improved value of the organisation. This view further exacerbates the possible misconception that organisational performance will be enhanced as a result of the investment into information systems including that of SSTs.

However, this may not be of concern in the South African context as the head of First National Bank's Connect ISP and Business Operations division confirmed that their organisation considers their focus on the advancement of their technology offering as a competitive advantage (News24, 2013). This strategy pays particular attention to the development of SSTs in order for the organisation to meet the needs of all its clients. It is in this respect that research may determine whether there is a correlation between the investment into SST's and organisational performance. In addition, there is also the probability of this phenomenon having a unique perspective in the South African context.

This research study will attempt to understand the relationship that investment in SSTs would have on organisational performance with confinement to the South African financial services industry by researching the dynamics of a particular case within this landscape.

1.2. Research objectives and questions

The primary objective of this research project is to understand how the investment in self-service technologies affects organisational performance within the South African financial services context.

The study will be supported by research based on the fulfilment of the following sub-objectives:

- Understanding the underlying reasons why organisations invest in SST as well as document their perceived expectations in terms of organisational performance including factors such as profitability, productivity, cost reduction and intangible benefits,
- Evaluate and compare the South African financial services industry context to these findings via the analysis of a single case study.
- Document, examine and understand the causal relationship between SST investments and organisational performance.

The primary research question that will form the basis of this study is:

- RQ1 - What is the impact on organisational performance as a result of investment in self-service technology within the South African financial services industry?

The research sub-questions to support the study are stated as follows:

- RQ2 – What are the drivers^a of a SST investments strategy?
- RQ3 – What is the nature of the causal relationship between SST investment and organisational performance?

1.3. Importance of research

With the advent of SST facilities throughout the world, there has been significant investment made by institutions across industries and sectors to improve and become leaders in deploying technology that would achieve an improvement in client retention and/or acquisition. While this investment and expectation of improvement was and still is taking place, there are no guarantees that the institutions would be benefiting from an organisational performance perspective (Hung, 2012).

Financial institutions in South Africa have and are still investing in SST channels and facilities without any definitive confirmation that this investment will provide an improvement in their organisation's performance. This is evident in the fact that Standard Bank of South Africa invested R12.9 billion on technology in 2011 with a targeted internet and mobile user acquisition of 2.4 million as one of its performance metrics (Sustainability Report, 2011).

With an understanding of the investment appetite in the South African financial services industry, this research study focussed on two primary aspects, namely the impact of investment in SSTs on organisational performance and the nature of the causal relationship between the two constructs.

The first, namely the impact of investment in SST on organisational performance was researched using a modified version of the updated DeLone and McLean (2003) model for IS success. The model enabled the researcher to link system quality aspects with net benefits and in so doing, enable the research to meet its stated research objectives. The model has been used primarily for pure technology research in the past and the application of this in an

^a A driver, for the purposes of this study, may be considered a critical factor that determines the success of an organisation.

SST context would be pioneering and contribute significant to the body of knowledge that exist while determining the outcome of this research exercise.

The second primary aspect of the study, is the causal relationship between the two constructs focusses on the nature of the relationship between investment in SST and the impact that it has on organisational performance. Once again there have been studies undertaken by Petter, DeLone & McLean (2008) and Gorla, Somers & Wong (2010) to understand the relationship between the two constructs with research limitations suggested further research was required. This research exercise builds on these findings that have been documented by the aforementioned academics and would provide further findings from a SST perspective as well.

The initial questions in previous research of whether investment in technology yields positive organisational performance and/or what the relationship between the two constructs are, have not been conclusively answered. Therefore the general significance of this research exercise is to extend on the abovementioned phenomenon while focussing on the SST aspects within the South African financial services industry.

1.4. Limitations of this study

The lack of empirical research in the investment in information systems, in particular SST, as well as the relationship dynamics between this construct and organisational performance or net benefits may be seen as a limitation and therefore may have impacted the generalizability of these findings.

An important limitation of this study is the selection of a single unit of analysis case study strategy as the basis of the research exercise. The findings are therefore limited to the dynamics of the organisation being studied and curtails or restricts any generalised assertions that may be revealed.

Another research limitation that may be documented pertaining to this study would be the desired level of participants in the data gathering process. The researcher estimated that at least three of the studied organisations executive committee members would participate in the interview process, however only one had the opportunity to be interviewed. The rest of the target population provided a relevant and good contribution to the study.

Considering that a cross sectional timeframe method was used in this research exercise, this study therefore is based on a 'snap shot' in time and therefore may not take into account the

rapid evolutions and trends being experienced within the SST industry and in particular the South African technology and financial landscapes.

The other limitation was the time afforded to complete the research data gathering and analysis process. The time limitation stipulated by the course program may have restricted the depth of the research process. In addition, as a result of time constraints, the findings were not returned to the various participants for their review and approval, however triangulation had taken place from a validity perspective.

The research limitations mentioned above represents openness and transparency in terms of this research and does not in any way had a negative impact on this study or the validity of the research findings.

1.5. Dissertation overview

This research project is to understand how the investment in self-service technologies affects organisational performance within the South African financial services context. In order to constructively meet the primary objectives of this research topic, the researcher found it prudent to organise this dissertation based on the research framework in the following manner.

1.5.1. Literature review

Webster & Watson (2002, p2) stated that “An effective review creates a firm foundation for advancing knowledge. It facilitates theory development, closes areas where a plethora of research exists, and uncovers areas where research is needed”. This chapter focuses initially on qualifying the primary constructs that form the foundation of the study. In particular, the types of SST facilities and aspects of organisational performance being researched as well as the context within which the research is being conducted, namely the South African financial services environment.

The balance of the literature review comprises of a rearward account of the documented perceptions of the financial services SST industry as well as a global analysis of the maturity and factors impacting SST industry. This is followed by a theoretical framework due diligence and concluded with a gap analysis exercise that highlights the objective of this research exercise.

1.5.2. Research Method

The research methodology encompasses the research design that justifies and motivates the philosophical stance elected by the researcher while the research methodology highlighted the outlined the research purpose, research approach, research strategy. In addition the data collection aspects are also justified in accordance with the theoretical archetypes and underpinned by the ethical considerations.

1.5.3. Analysis and findings

This section represents a detailed account of the various phenomena uncovered or that has been surfaced through the data analysis process. The section is divided into three primary sub-sections, namely investment in SST, impact on organisational performance and relationship dynamics. All the findings and interpretations are aligned to the above subsections.

1.5.4. Conclusion

The conclusion encompasses the theoretical and practical implications of this research exercise as well as limiting implication with recommendations for future study. A significant component of this section would be to demonstrate whether the research objectives and questions were met and answered respectively.

This section provides a high level summary of the outline of this research study and leads into the next section that provides a detailed account of the literature or body of knowledge that already exists on this research topic.

2. Literature Review

The literature review process encompassed the review of research material that exists with regard to the relationship investment in SSTs and organisational performance.

2.1. Introduction

The study first examined literature to define the scope of the primary variables which are the investment into SST and the impact on organisational performance, including a time lapsed and geographic impact review. Second, a theoretical framework due diligence was conducted in order to determine the appropriate model for this study, followed by the alignment and application of this model to the research objectives. Finally, the material collected was reviewed in order to determine gaps or areas of research lacking conclusive deductions. The full scope of the literature review is outlined, described and illustrated in Table 1 below.

Section	Description of literature review objectives
Definition of variables	This section focusses on the qualification and literature research into the primary constructs of this research project, namely Self Service Technology (SST), organisational performance and the South African financial services industry
SST Impact review	This is a literature research exercise that reviews the financial services SST industry dynamics from both an evolutionary (pre 2000 to present) as well as a global trend analysis (highlighting trends and challenges) perspective.
Theoretical Frameworks	This section presents a theoretical framework due diligence that was conducted in order to provide evidence that the applied theoretical model is appropriate for this study.
Review of success dimensions	This section provides a literature research and review into the various constructs within the selected theoretical model in order to determine where gaps exists for the opportunity to provide research. The primary constructs, among others are reviewed, namely the system quality aspects, net or organisational benefits and the causal relationship.

Summary	The summary provides an overview of the literature gaps presented for further study and what gaps are relevant to ensure that the aforementioned research objectives are met.
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Table 1 Literature review outline.

2.2. Definition of influencing variables

SSTs have evolved in various industries over time and established itself as a fundamental component or factor with the business landscape and in some case revolutionised or eliminated the need for human intervention (Yang & Klaasen, 2008). Yang and Klaasen (2008) further stated that the implementation of these technologies, with its expected efficiencies, will contribute positively to the organisation’s overall standing, resulting in reactions of approval on the financial markets similar to any other corporate event.

The assessment expressed above provides context to the rapidly changing financial services environment where there is a perceived shift towards technology as an enabler of future improvement and benefits. Musara & Fatuki (2010) supported this phenomenon of a changing environment when their study highlighted that 94% and 98% of Standard Bank and First National Bank’s clients recognised the advancements and innovation by listing the various technologies that they utilise on a daily basis such as ATMs, cellphone banking and the like. It is evident that banks have invested in these technologies with the assumption that both their clients and themselves will benefit from this.

On the basis of these assertions, this research assignment is confined to a relationship between self-service technology and the organisation within the context of the South African financial services industry. For this study, it would be prudent to define the fundamental concepts that will form the basis of this research within this section before diverting any attention to the available literature that supports the study.

2.2.1. Self-Service Technology (SST)

Hung (2012) considers SST as an adaptation of the current business systems in order for customers to consume products and services without the intervention of or contact with that organisation’s employees. This simplistic definition accurately describes the purpose and objective of this type of technology as being an enabler for the organisation to allow their customers to interact at their convenience. Rowley (2006, p339) stated that “E-service can

be usefully conceptualised as an interactive information service”. E-service is defined by Rowley (2006) as a ‘technology-based self-service’.

SSTs have been introduced into many industries such as accommodation, travel, retail, banking and the like. The specific focus for this research will be on the banking industry and will include automated teller machines (ATM), cellphone banking and internet banking. These facilities have been and remain the primary traditional business enablers. However, Yang and Klaasen (2008) suggested that future technologies such as Radio Frequency Identification (RFID), Electronic Product Code (EPC) and other related facilities may be introduced to broaden and improve the banking industry’s SST offering. These future technologies fall outside of the scope of this research topic.

2.2.2. Organisational Performance

Scholars have always been trying to understand how the investment and growth in IT within an organisation would improve organisational performance (Melville, 2004). IT business value or organisational performance is used interchangeably and is loosely defined as the IT impact on profitability, productivity, cost, competitive advantage and other measures of performance (Devaraj & Kohil 2003; Melville, 2004).

This definition is contrasted by Carr (2003) who questions the impact of IT value on the firm if regarded in its broader sense as certain resources within IT do not differentiate the organisation from its competitors. For example, infrastructure and networking components will not provide any improved organisational performance as it is an essential commodity.

As a result, the views expressed by previous research, allows for a more narrowed and focussed definition of organisational performance for this research topic. Therefore the IT value or organisational performance scope for this research topic will be defined as the non-commoditised components of the SST applications that improve the profitability, productivity, cost efficiency and other intangible benefits.

2.2.3. South African financial services industry

There has been an internet penetration of 17% of the total South African population which constituted 8.5 million users and a 29% annual increase between 2010 and 2011 (Goldstuck, 2012). Tan and Teo (2000) alluded to the fact that it has been proven that internet users are more likely to adopt internet banking as a service facility. This behaviour therefore encourages the use of self service facilities within the financial services sector or banking sector.

Similarly there has been a significant adoption of mobile banking in the South African financial services or banking sector, as statistically institutions such as First National Bank and ABSA have reported mobile banking user registration figures as 4 and 3.6 million users respectively (Clarke, 2012). In addition to this Clarke (2012) documented a study undertaken by Capitec Bank that established the proportionate usage of self service facilities with the results indicating that 39% of clients made use of internet banking with 24% utilising ATMs while only 5% made use of mobile banking applications. These statistics must be taken into context as Capitec Bank targets the lower income market and therefore the proportional SST usage will differ to the leading banks mentioned earlier.

Considering the growth of the SST offerings within the South African financial services or banking sector, it is evident that there has been significant investment into these facilities. As a result of the focus and attention placed on the deployment of these facilities, the South African financial services SST offering may be considered as an established industry and therefore will have the necessary criteria to conduct a research of this nature.

2.3. SST Impact Review

Research on the application of SST facilities have been conducted extensively over the past twenty-five years as a result of the introduction of this channel. In order to create an understanding of the evolution of the attitude and views concerning the investment into, the relationships and the perceived benefits of SST facilities, it would be practical to review the literature in this regard.

The review will consist of two sections, namely the time-lapse review across decades as well as the global anticipation and adoption of SST.

2.3.1. The time-lapse review across decades

Considering the invention of the internet in 1991 by Tim Berners-Lee (Mowery & Simcoe, 2002) advancements in most sectors may be attributed to this event. The financial services industry also embraced this phenomenon. The aim of this section is to reflect on the research findings across three decades of evolution of SST offerings. Three time lapsed bands were the focus commencing with the period prior to the year 2000 when the internet was in its infancy, the period between 2001 and 2009 when the application of the internet was being considered beneficial, and finally, the realisations or misapprehensions of expectations of the applications of the previous period.

2.3.1.1. Year 2000 and prior

SSTs were considered highly cost effective during the period prior to 2000, however, based on their study, Ramsay & Smith (1999) highlighted that clients preferred ‘face-to-face’ interactions at the bank. These findings were mainly attributed to the bank branch still being considered a transaction channel. Furthermore, Prendergast & Marr (1994) concluded in their study that the introduction of internet banking and application of ATMs would not impact on the role of the bank branch network in its existing form at the time and it will remain an important strategy of the banking industry.

Impact on physical branch network

Mols (1998) predicted that the internet banking offering would change the retail banking distribution landscape by adding an additional channel. In addition, Mols (1998) also concluded the radical reduction of the bank branch network, increased additional competencies such as the information technology capabilities and the like, and the consolidation of smaller banks due to cost efficiencies would become prevalent. It is evident that there was an acceptance of the application of SSTs. However there were strong views expressed that the impact would not be as significant on the banking strategy of the time but merely a supplementary channel.

Organisational expectation

From an organisational benefits perspective, there was great uncertainty as to whether financial performance was achieved through the investment in SSTs. Stratopoulos & Dehning (2000) and Tam (1998) described the expected positive relationship between investment in IT and financial performance as ‘anemic’ based on Bronjolsson’s (1998) productivity paradox theory. The theory introduces prohibiting factors such as mismanagement of resources, a lack of measurement instruments and the like. Stratopoulos & Dehning (2000) had acknowledged that investment in information technology would manifest itself on the bottom line of organisation, but only after several years.

The inclusion of SSTs as a channel or component of a business model was being explored during this period and faced with a level of apprehension toward the full potential of this type of offering. This is evident as the views expressed in terms of the insignificant impacts of an electronic channel on the branch network coupled with the rebuff of the performance expectations as a result of investment in SSTs, and hence the cause for collective apprehension.

2.3.1.2. Period 2001 to 2009

The SST phenomenon gained momentum through the next decade; however this impetus introduced a different set of challenges and attitudinal shifts within the banking industry.

User adoption and challenges

With increased adoption of the SST facilities during this period and the constant self and market imposed obligatory drive by organisations to foster ease of use offerings, Lee (2009) and Suh & Han (2002) highlighted that this increased a psychological and/or cultural awareness of trust by the users considering the nature of the transactions, namely savings and investments. Suh & Han (2002) iterated that the perception that user friendliness and ease of use were always being considered the most significant factors to user acceptance and adoption. However trust is considered an additional factor in this industry. Lee (2009) supported this finding by confirming that the ability for individuals and/or organisations to respond to perceived risks will determine the success of the organisations perceived benefits.

In addition to the aspect of trust, Kuisma; Luakkanen & Hiltunen (2007) mentioned that there was a perception of internet banking being 'unsafe' with the responsibility of errors and mistakes being shifted to the clients. Kuisma et. al. (2007) remedied this in their discussion by highlighting that these apprehensions characterises the interaction with a new channel and that a process of learning and confidence would lead to holistic adoption.

Furthermore, SST channel offering of this era was evolving while the internet as an infrastructure was growing and improving at a rapid rate. According to Kuisma et. al. (2007) and Green & Van Belle (2003), technological evolution had not kept pace with expectations of both organisations wanting to advance their offering as well as clients having their needs met. The primary shortcomings were factors such as inconsistent internet connectivity, official receipts, changeable passwords and so forth to name a few. Kuisma et. al. (2007) considered these barriers as significant for the time while having a significant influence on adoption during this period as non-user would acknowledge this a reason to continue via the traditional branch network channel.

Green & Van Belle (2003) continues by deducing that as a result of these issues experienced, the SST channels, and internet banking in particular, are needs based and not necessarily considered an essential channel.

Organisational perceptions and expectations

It is evident that even though organisations invested in their SST channels, many factors both physical and psychological, were becoming inhibiting factors to expected adoption. From an organisational performance perspective, a few challenges that were pertinent to this period arose as a result of their investment in these channels.

In contrast to the views expressed in the pre-2000 literature period, there was a growing view that the investment in information technology, and in particular for the SST channels, does correlate to a benefit from an organisational performance perspective. Dedrick; Gurbaxani & Kraemer (2003) findings confirmed that on average there is a return on information technology investment, however it may differ from one organisation to another depending on their 'idiosyncrasies'. The return was therefore attributable to the manner in which the organisation recognized the source of its revenue or savings. Ou, Hung, Yen & Liu (2009) corroborated with these findings by stating that banks must strive to aggressively implement SST as it will have a positive impact on operating costs in its drive for efficiency. Uo et. al. (2009) also noted in their study that the Chinese and Taiwanese banking industry had adopted the ATM channel but were yet to embrace the internet banking channel, which was perceived to be a more cost effective channel and hence the desire to convert clients.

Yang & Klassen (2008) provides a contrasting insight to that of Dedrick et. al. (2003) and Uo et. al. (2009) by stating that markets do not respond to organisations that make SST announcements as it does not see this as a sustainable competitive advantage. The findings emphasized that SST channels must be incorporated into a sustainable 'business model' for the organisation to remain competitive and may not be considered as a sole catalyst for organisational performance (Yang & Klassen, 2008). SSTs are generally rolled out in a piecemeal iteration and therefore the perceived benefits are realised over time and cannot be directly related to an initial or subsequent launch.

Deductions

The decade between 2001 and 2009 provided progress in terms of the adoption of SSTs within the banking industry. However based on the literature there was no unequivocal acceptance or satisfaction with this channel. Organisations were uncovering psychological and physical hurdles as a result of making 'improved' SST facility offerings available to their clients. It is evident that the expectations of both the client and the organisations were not met during this period with the need for improvement.

When addressing this from an organisational performance perspective, the literature provides a frail argument that investment in SST channels contributes to financial benefits which is contrasted by the findings of Yang & Klassen (2008) who stated that stock markets do not react to SST announcements as it does not consider this as a sustainable single competitive advantage. The findings during this era nevertheless suggests that the banking industry believes that there is a need for the SST channel as supplement to the bank branch network, however there is no conclusive evidence that there are organisation performance benefits being derived.

2.3.1.3. 2010 to present

Ganguli & Roy (2011, p183) stated that “Owing to high usage of technology by bank customers in today’s world the role of customer service has become more important as customers are interacting through some technology and not any human being”. The statement in their findings highlights that there is significant proliferation of SST offerings being deployed by the banking industry in order to improve service. It also signifies that the bank has acknowledged the SST channel as a viable channel whether absolute or part of a business model.

Furthermore, Ganguli & Roy (2011) in their study found that the ease of use, reliability and service affected customer satisfaction and loyalty positively in the banking industry. However, Montazemi & Qahri-Saremi (2015) deviates from the finding above in a later study by confirming that there are unique anomalies within the banking industry when it relates to interaction with SSTs. Montazemi & Qahri-Saremi (2015) noted that the banking clients are willing to sacrifice ease of use and quality of services attributes of SST facilities for the information quality. The reason for this preference of information quality of the content being provided was due to the fact that clients were transacting and making decision on their own savings and investments.

Shift in organisational perceptions and viewpoints

Investment in information technology was expected to be between \$270 billion and \$460 billion in the banking industry for 2013 (Banking and Technology snapshot, 2012) with the majority of the costs being attributed to transactional banking. SST channels form a significant component of the transactional banking landscape as it allows clients to interact with the underlying banking system directly. By virtue of these assertions, there would be a premise that significant investment is being made into the SST channel itself as an extension of transactional banking.

Mishra & Singh (2015) accepts that investments are being made into the SST channels, however as a result of the proliferation of offerings, namely ATM, internet banking and mobile banking, there is concern in terms of focus towards a preferred facility that will engage all clients and convert into benefit for the organisation. According to their study, ATMs are established facilities with investment focus decisions still being split between internet banking and/or mobile banking (Mishra & Singh, 2015). It is evident that the SST landscape is ever evolving and that investment decisions are changing over time with a significantly different strategic intent.

SST channel facilities in the banking industry provided a reduction in transactional cost for the clients and therefore by virtue of this fact it provided the organisation with increased revenue as clients approached interaction freely instead of sparingly in order to save on costs (Musara & Fatuki, 2010); Gensler, Leeflang & Skiera, 2012). Gensler et al. (2012) confirmed that the net revenue generated from repeat interactions may be as high as 50% greater than if an organisation were to service that client via the non-SST channel. This net revenue opportunity will have a significant impact on the profitability of an organisation if it is maintained.

Hung (2012) further supports the evidence that SSTs are positively associated with organisational performance and confirm that that these channels are profitable, particularly ATMs. The research cautioned that investing in SSTs would relate to positive organisational performance however it must not be construed as a performance growth strategy. Investing in SSTs on its own will not grow the organisation's revenue and profits, however investing into a growth strategy that include SST channels as an enabler will provide a growth strategy (Hung, 2012).

2.3.2. Global adoption of SSTs

The previous section examined the evolution of SSTs within the financial services sector with a particular focus on the investment into and the perceived and/or expected benefits to be derived from an organisation's perspective. This section will examine SST channels, from an investment and perceived benefits perspective, the perception of the global financial services economy. This examination will be split into three geographical areas, namely the western, eastern and African regions.

2.3.2.1. Western Regions

The western region study focuses on the impact of SSTs in the North America's and Europe in particular.

North America

Curran & Meuter (2005) noted that within the United States of America, there was a significant disparity between adoption rates of ATM and mobile banking of 79.5% and 27.5% respectively. The slow adoption of, in particular, mobile banking was attributed to security, system quality and attitudinal or behavioural aspects with the security risk being the highest contributing inhibitor to adoption (Curran & Meuter, 2005). Zuccaro & Savard (2010) in a study conducted on the top six banks in Canada, highlighted an increase in internet banking transaction activity between 2002 and 2007 of 239%, with a decline in cash withdrawals via ATMs of 23%. The United States of America also experienced a year on year growth rate of 37% between 2003 and 2004 for internet banking which could be directly related to significant investment into infrastructure and data warehousing by the affected organisations within the financial services industries (Zuccaro & Savard, 2010).

From the research conducted in North America, it is evident that SSTs are relevant with distinct shifts from ATMs to internet banking with mobile banking requiring attention. The mobile banking channel are challenged with security and risk fears that require customer awareness intervention by the organisations to ensure customer contentment. There is also evidence that significant investment is being made on this continent within the SST channels in order to reap future benefits due to cost reduction and the like.

Europe

The European financial services landscape outlines a diverse approach towards SSTs and the adoption thereof. Jayawardhena & Foley (2000, p29) highlighted that the challenges in the United Kingdom banking sector are as follows:

The challenge that lies ahead for banks is fourfold. First, they need to satisfy customer needs that are complex and difficult to manage. Second, they need to face up to increased competition from within the sector and from new entrants coming into the financial services market. Third, they need to address the demands placed upon the supply chain. Finally, they must continually invent new products and services in light of the changes described above. Central to these challenges are delivery strategies of banking services.

Sayar & Wolfe (2007) stated that the incentivisation for adoption of SSTs by United Kingdom banks were among others new revenue streams, cost reduction and access to users via various channels. The main challenges highlighted were technology infrastructure, security and resistance to change.

From an Italian market perspective, Corrocher (2006) noted that the native organisations considered the implementation of the SST channels primarily as an access to new revenue streams and less about providing a value added service to clients. Therefore banks with large branch networks and significant client bases felt less reluctant to invest in SSTs as there was a belief that they would survive as a result of the distribution of their core products.

In contrast Finland, Denmark and Portugal enjoyed favourable SST channel adoption rates (Mäenpää, Kaleb, Kuusela & Mesirantaa, 2008; Mols, Bukh & Nielsen, 1999; Proenca & Rodrigues, 2011. Mäenpää et al (2008) highlighted that all user groups studied in Finland projected a confidence towards SST channels being utilised even though there were varying levels of familiarity with the technology. It was concluded that due to the successes of organisations conveying a positive 'benefit' message to the consumer, the user would be less reluctant to question the security and risks associated with the channels.

Proenca & Rodrigues (2011) research drew similarities to those of Finland, however the users of the SST channels portrayed high levels of adoption and familiarity. In addition to the adoption, the users and clients entered a new realm whereby they became price sensitive about the services that were being offered which added a new dimension to the dynamics of the offering. Proenca & Rodrigues (2011) further profiled the majority of Portuguese SST channel users as having no less than twelve years schooling on average and hence the adoption with advanced behavioural dimensions.

Mols et al. (1999) noted that the successful adoption of SST channels in Denmark was due to the majority of large retail banks identifying the electronic channel as a strategic distribution channel. This strategy would manifest itself in the reduction of cost for both clients and the organisation as well as the perceived goal of closure of branches. Mols et al. (1999) acknowledges the decisions were being made as an organisational strategy that will benefit the users in the future.

The European market reflects a high level of adoption as well as acceptance by users. It is evident that users have, in the main, overcome issues such as security and risk reservations, apart from the United Kingdom who still considers these as challenges. There is also evidence of user or client familiarity of the channel and some cases an advanced dynamic such as price sensitivity has already been introduced.

Based on the research, financial services organisations have included the electronic distribution channel, namely the SST channel, into their overall strategy quite early in the evolution with the expectation of reaping organisational performance benefits. Apart from the single viewed objective of the Italian banking industry expressed by Corrocher (2006)

whereby the investment into SSTs were seen an organisational benefit only, the rest of the western financial services landscape considered it as a strategic investment that includes individual user benefits as well.

2.3.2.2. Eastern Region

The eastern region encapsulates relevant research garnered primarily from Asian countries.

The primary impact on adoption of the SST channels are trust, risk and security which is corroborated by Purwanganegara, Apriningsih & Andika, (2014); Kaushik & Rahman (2015); Sohail & Shannugham (2003). The Indonesian study conducted by Purwanganegara et al. (2014) highlighted that adoption of SSTs were severely impeded by the lack or absence of regulation within the industry. This absence of regulation weighed severely on the user's willingness to embrace the SST channel and participate in its benefits, while creating a perception that the law cannot sufficiently protect them from fraud (Purwanganegara et al, 2014). This shortfall in regulatory protection for the user has a direct impact on the organisation as benefits are not realised as a result of factors that are beyond its control.

According to Kaushik & Rahman (2015) the ATM adoption rate in India is highest at 78% while mobile banking of 13% is considered a laggard due to attitudinal factors of risk and security as well as the system quality aspects such as ease of use and. There is a belief that more needs to be done within the industry from an awareness perspective in order to improve adoption rates as well as shift primary usage from ATMs to mobile banking (Kaushik & Rahman, 2015).

Social issues impacting Malaysia & Jordan

The Malaysian industry is also impacted by the factors of trust, risk and security, however there is a typical adoption among the affluent users who seem to overlook the fears that are raised by the less familiar users (Sohail & Shannugham, 2003). The Malaysian industry also placed a significant emphasis on client awareness and promotion campaigns in order to increase the adoption of SST channels within the market in order to participate in the perceived organisational benefits.

An indigenous societal challenge that impacts this region in terms of SST channel adoption is the existence of 'cash only' cultures (Salhieh, Abdu-Doleh & Hijazi , 2011; Wonglimpiyarat, 2014). Salhieh et al. (2011) highlighted that the largest inhibitor to the adoption of SST channels within Jordan would be the existence of a cash only society. In order for organisations to begin investment into SST channels, they must adopt strategies that would transform users toward a 'cashless' society. Wonglimpiyarat (2014) also noted that Thailand

faces similar challenges in terms of transforming their user base into a 'cashless' society, however their challenges are not cultural as in the case of Jordan. The Thai challenges centres around risk and regulation as inhibitors to adoption of the SST channels and hence users are comfortable with cash based transacting (Wonglimpiyarat, 2014).

Infrastructural issues impacting Saudi Arabia & Thailand

Technological interoperability and improvements such as internet, hardware and the like are considered another inhibitor to adoption of SST (Wonglimpiyarat, 2014; Al-Somali, Gholami & Clegg, 2009). Al-Somali et al. (2009) singled out the quality of the internet as one of the primary inhibitors to the adoption of SST channels in Saudi Arabia. This shortfall contributed to the limitations placed on the functional aspects of the SST facilities and exacerbated negative attitudinal factors such as trust and resistance to change. This lack of internet quality was directly related to the lack of investment in infrastructure within Saudi Arabia.

Thailand experienced a similar technological challenge, however in the form of a lack system or technological interoperability which affected its adoption of SST channels within their financial services industry (Wonglimpiyarat, 2014). With a mobile penetration rate of 115% in Thailand in 2012, the banking industry in Thailand are struggling to capitalise on this penetration due to the lack of standards within the mobile phone industry. SST adoption rates are expected to improve once the mobile phone industry standardises their infrastructure.

Organisational impacts in Taiwan

SST strategies to improve organisational performance and perceived benefits within this region are at various stages and levels due to the position some of the sovereign industries find themselves. Ou et al., 2009 iterated that banks must be aggressive when targeting a SST strategy, similar to those in Taiwan who have pursued ATM service as a strategy. This strategy must be seen as a cost reduction exercise that will impact profitability and the like within the organisation. Purwanganegara et al. (2014) highlighted that there are large factors impacting on the perceived benefits of the organisation. One of the large factors impacting the perceived benefits in Indonesia is the lack of regulation which influences adoption and therefore reduces organisational performance.

From the research conducted, there are significant challenges that requires resolutions within the Eastern or Asian countries region both from an investment strategy perspective, namely transforming to cashless societies, improving technological capabilities to creating

trust. The adoption and maintenance of user bases are important for organisations to achieve its perceived benefits.

2.3.2.3. Africa

According to Asongu (2012) the traditional banking offering in the African region is less prevalent, however more innovative. The advent of the mobile phone provided a powerful means for millions of Africans to save and transact while shaping the informal financial sector which was non-existent to a large degree. Asongu (2012) also iterated that the mobile banking phenomenon allowed Africans to interact across geographical regions with a degree of efficiency and security.

Considering this backdrop of the impact of mobile banking on the African continent, Kimenyi & Ndung'u (2009) expanded on the Kenyan scenario that experienced an SST adoption rate in the form of bank account increases by 191% between 2006 and 2009. These changes are attributed to technological advancements that allows easy access to bank account and the management thereof. The innovative introduction of money transfers within Kenya and the across the African continent allowed clients to transfer funds from mobile devices at low costs.

South Africa

The South African economy is considered the most advanced economy on the African continent, however according to the study conducted by Bick, Brown & Abratt (2004) there is preference for the use of ATM and internet banking as opposed to mobile banking that also manifests itself very strongly in the rest of Africa. Bick et al. (2004) highlights that users would prefer completing an online transaction via the internet banking SST channel than physically visiting a branch. Singh (2004) corroborates this point, however intimates that users would opt for using their bank's SST channels only in order to overcome their security concerns.

Brown, Cajee, Davies & Stroebel (2003) advocated that there was a disproportionate rate of mobile banking adoption to the cellphone market penetration rate of 6% and 25% respectively. Brown et al. (2003) believed that the perceived risk was still an inhibitor however the collaboration between banks and network service providers and the promotion of the perceived advantages may be key to improving the adoption rate in the future.

Based on the research, it is evident to note that the South African financial services industry pursued adoption of SST channels very early in its product lifecycle. Maduku (2014) stated that there was a positive attitude towards the internet banking channel with continued loyalty

in South Africa, although users also demonstrated low levels of trust in the facility. Although the trust aspect has hovered around the SST channels for more than a decade, Maduku (2014) highlighted that organisations should invest in state-of-art security features while promoting the safety of the facilities.

Once again, the literature proposes the investment into the quality aspects of the SST channels. For South African organisations, investment in this channel is important however there must be a strong business case for improved organisational performance. Shambare (2011) stated that even though mobile banking adoption rates do not appear to be acceptable as yet, mobile banking must form part of the organisation's SST channel strategy as it provides a perfect opportunity to distribute banking and financial services products to a 'critical mass' of the customers. In the South African context and considering the growth opportunities within an under developed market, a SST investment strategy may have a positive impact on the organisation's performance.

In summary, based on the research conducted, the western region portrays an advanced level of SST channel adoption that includes positive user attitudinal and behavioural factors. Organisations have also deliberately invested while targeting an expectation of improved organisational performance. In contrast, the eastern regions are facing a range of challenges both attitudinal and physical or technological, which are inhibiting adoption of SST channels. It is evident that investment is required by the various organisations, however these investments may not solely be for technology but user awareness as well.

The African region could be considered the most innovative borne out necessity due to the lack of resources and under developed markets, for example a non-existent inform financial sector. There has been ingenuity in the manner in which the mobile banking platform was used to include the mass market across geographical regions. The region is underdeveloped in term of the full spectrum of the SSTs being researched in this paper. South Africa, however based on the research, has proven to be an anomaly in terms of the region and faces similar challenges to those of the eastern region discussed above, and may be treated as such during the analysis and findings later in this paper.

2.4. Theoretical Frameworks

The challenge of this research topic is to gain an understanding of how investment into SST will enhance or reduce organisational performance. This relationship will become the focal point of this study; however it must be acknowledged that there will be attributes or components between these primary constructs that will allow them to form a linkage. In order to successfully review this relationship, there would be a need to align this research to a

theory or set of theoretical frameworks. This section will examine theoretical based research frameworks.

2.4.1. DeLone and McLean model for IS success

DeLone and McLean (2003, p10) confirmed that “The measurement of information systems (IS) success or effectiveness is critical to our understanding of the value and efficacy of IS management actions and IS investments” as support to their published research of the revision of their theoretical model. It is evident in their statement that IS success may be measured on the basis of the primary variable reflected in this research topic, namely investment into IS and achievement of IS value from an organisational perspective.

Melville (2004) recognised that organisations are continuously evaluating the return that they receive on IS investment by asking questions such as ‘Has IS benefited the organisation?’ or ‘Has IS had a positive impact on the organisation?’ These questions, even though simplistic, tend to highlight the need for organisations to quantify their benefits. The relationship between investment and benefits are now being established for the purpose of this research topic. Pérez-Mira (2010) suggested that this relationship is interconnected via a series of interdependent dimensions that influences each other in order to determine the impact on the organisation.

As a result of the desire to quantify or measure IS success, DeLone and McLean (1992) developed a theoretical framework in 1992 that consisted of six interrelated dimensions known as the DeLone and McLean model for information systems (IS) success. These dimensions were system quality, information quality, use, user satisfaction, individual impact and organisational impact. Seddon (1997) and Wang (2008) highlighted that this model provides for the categorisation of IS success measures with causal interdependent relationships between these categories. These interdependencies are clearly visible in Figure 1 below.

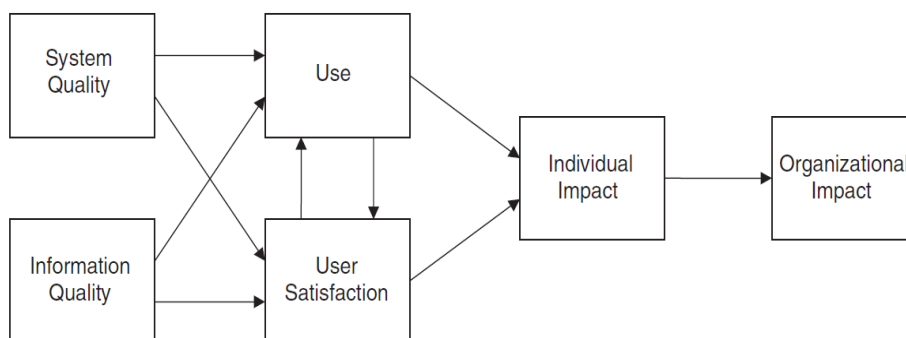


Figure 1 : DeLone and McLean IS success model (1992)

2.4.2. The Updated DeLone and McLean (2003) model for IS success

The initial version of the DeLone and McLean model for IS success was critiqued by Seddon (1997) in particular, during the years after its adoption. Various shortcomings were highlighted in the model although it was the most extensively used theoretical framework for measuring IS success (Pérez-Mira, 2010).

The most pertinent shortcoming of this theory was highlighted by Seddon (1997) where it was documented that the model contained a combination of process and causal variance. This combination was considered to lead to confusion as a process flow is consequential while a causal factor is relational.

DeLone and McLean (2003) revised their model to accommodate the various pitfalls to allow for future empirical research via a more conclusive framework (Figure 2).

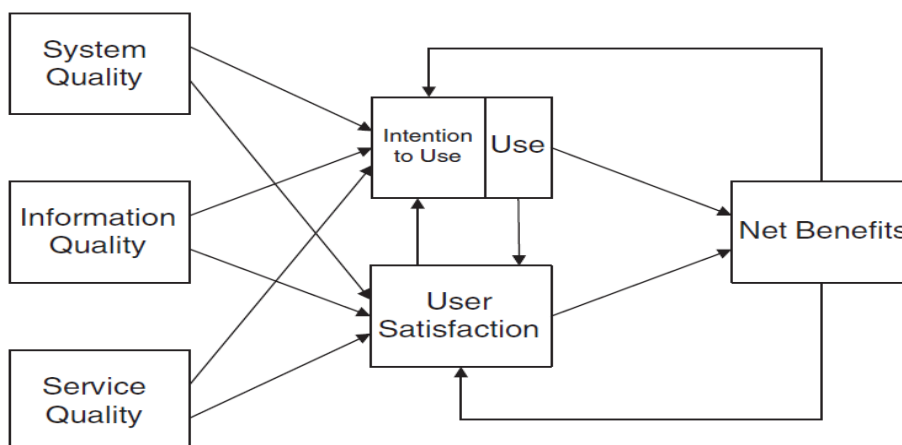


Figure 2 : DeLone and McLean IS success model (2003)

The revised model made the following allowances (DeLone & McLean, 2003; Seddon, 1997):

- Included an additional quality dimension in the form of 'service quality' that was deemed to influence the 'use' and 'user satisfaction' success measure dimensions,
- 'Use' was converted to a more attitudinal measurement criteria of 'Intention to use' resulting in a more causal association with other dimensions. In the previous model 'use' was considered a behaviour and therefore difficult to measure.
- 'Individual Impact' as well as 'Organisational Impact' was collapsed into a single variable called 'Net Benefits' in order to reduce the consequential elements from

individual to organisational. This amendment allows the organisational relationship, whether positive or negative, to be associated with 'Use' and/or 'User Satisfaction' without having to pass through a dimension as per the previous model.

The revised DeLone and McLean model (2003) is focused on the actual net benefits achieved including both individual and organisational, therefore considering the necessary variables or dimensions as interrelated parts of the measurement construct.

2.4.3. Technology Acceptance Model (TAM)

In the early 1980's there was the need by various organisations to measure the success of their investment into information technology. Legris et al, (2003) noted that organisations were experiencing inconsistent feedback considering the results of studies performed by the Standish Group in 1998 where information technology project success rates for large organisations were as low as 26%. As a result of this, researchers had concentrated on developing a model that would predict system use. The Technology Acceptance Model (TAM) depicted in figure 3 below, was introduced by Fred Davis in 1985 as a very rudimentary means of measuring information systems success based on usage.

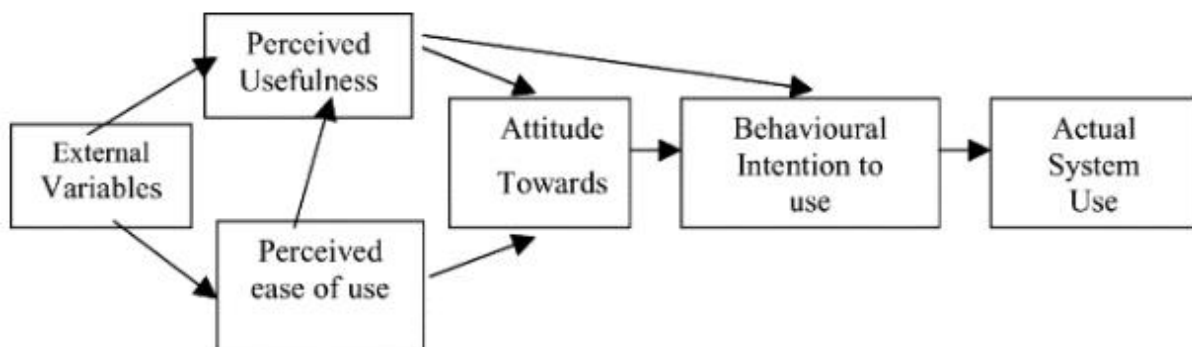


Figure 3 Technology Acceptance Model

Source: Legris et al. (2003)

The framework is an information systems theory that models how users accept and use new technology based on the two influencing factors, namely perceived usefulness and perceived ease-of-use (Davis, 1989). It was concluded in further research that TAM was useful but too simplistic and therefore needed to be incorporated into a model with additional variables (Legris et al., 2003).

This theory may well be considered for this research study. However the expected outcome focusses on the organisational performance and not merely the acceptance of SST. In support of this observation, Susanto and Zo (2011) emphasises that TAM is based on future net benefit achievement through the usage of information systems, while it differs in purpose with the DeLoan and McLean model for IS success that focusses on the actual net benefits relating to the usage of the technology.

Considering the argument above, the evidence conclusively confirms that TAM would not be the appropriate theoretical framework to support this research study.

2.4.4. Resource Based View (RBV)

Jacks & Schilhavy (2011) references the Resource-based view model (RBV) by defining it as a pervasive theoretical framework that radically centres on maintaining competitive advantage in order to create organisational value. The model concentrates on creating value through resources by meeting four criteria types, namely employing a value creating strategy, rarity of offering, in-imitability and non-substitutability.

These factors in combination will allow organisations to maintain a competitive advantage in almost all industries due to the fact that the culture of that organisation would be driven to perform in that manner.

This theoretical framework will prosper within a competitive market place similar to that of the current mobile device technology industry where competitive advantage is of critical importance (Teece & Shuen, 1997). The RBV theoretical framework also provides shortcomings as a structure for this research topic as the fundamental objective is to understand the relationship between the initial investment and the organisational performance in an industry that is not primarily driven by technological competitive forces to survive but rather financial services.

In conclusion, based on the reviewed theoretical frameworks, the updated DeLone and McLean (2003) model for IS success will be used as the underlying structure for this research study.

2.5. Review of Success Dimensions

This section will review previous studies that has already been conducted on the six interdependent dimensions of the updated DeLone and McLean (2003) model for IS success, with reference to the research study, in order to determine if and where there may be shortcomings that may provide opportunities for further insights.

2.5.1. Investment in Quality

The investment in information technology within the financial services sector globally is estimated to be between \$270 billion and \$460 billion for 2013 (Banking and Technology snapshot, 2012).

Standard Bank South Africa Limited confirmed that they had incurred an overall information technology cost of R12,9 billion in 2011 which included a targeted acquisition of 2.4 million internet and cellphone banking subscribers (Sustainability Report, 2011). In addition, the bank processed 819 million internet banking transactions while only 63 million transactions were manually processed in the branch network by tellers.

On the basis of the evidence above there is an indication that firms are investing significantly into the information technology including SST as there are opportunities to meet many business objectives including customer satisfaction and improved organisational performance.

Investment into SST is presently an accepted business initiative within the financial services and banking sectors, and therefore for the purpose of this study it will be postulated that investment is an on-going commitment by the firms in this sector. In addition, the investment into this SST will be synonymously associated with the quality dimensions of the DeLone and McLean model for IS success (2003) as it is the driver of any system, information or service quality.

Gorla et al. (2010, p207) stated that “excellence in IS quality involves using state-of-the-art technology, following industry ‘best practice’ software standards, and delivering ‘error free’ performance”. This statement supports the quality dimensions that are included in the DeLone and McLean model for IS success (2003) and has been researched in the following manner.

System Quality

System quality may be described as the characteristic that makes a system user-friendly and effective (Petter et al, 2008). System quality in the context of SST is imperative as the adoption of this relatively fledgling technology channel has to comprise of these characteristics in order for it to continue on its growth path. This dimension is commonly measured via the perceived ease-of-use that is related to the TAM (Davis, 1989).

Information Quality

Information quality is defined as those constructs that may be considered system outputs as a result of predefined process similar to that of manufacturing and so forth (Petter et al, 2008; Pérez-Mira, 2010). Gorla et al. (2010) hypothesised that information quality contains strong links with organisational impact from a business anticipation and management perspective.

However, Petter et al. (2010) considered that this, as a dimension, had strong associations with user satisfaction from an external client perspective. In the context of the study, the association and measurement will relate to the client expectation in terms of the perceived information quality as a result of system generated output. In this instance it would mean the accurate fulfilment and reporting of a financial transaction via a mobile or remote channel that is appropriately efficient in its execution.

Service Quality

Service quality is the latest dimension that was added to the DeLone and McLean model for IS success (2003). This dimension may best be described as the support that is afforded to the user in order for that user to maintain the standard of interaction with the system. Zhu et al. (2002) concluded in their research that client's evaluation of an IT based service was directly related to their experience of use of that service including the support via the SERVQUAL dimensions and eventually influencing the client satisfaction dimension. SERVQUAL is a service quality framework that was derived to measure the service quality provided in various sectors (Parasuraman, Zeithaml & Berry, 1988; Parasuraman, Zeithaml & Berry 1991).

The current research references the SERVQUAL framework as depicted in figure 4 below that contains dimensions such as reliability, responsiveness, competence, access, courtesy, communication and so forth, as the most appropriate measure of service quality (Petter et al., 2008; Zhu et al, 2002). Based on their studies in the United States, Parasuraman, Zeithaml & Berry (1994) listed a set of lessons that organisations should adhere to when aspiring to achieve success from a service quality perspective. These lessons included listening to the customer, achieving reliability, offering a basic service, implementing a basic robust service design and so forth.

From a SST perspective, the service quality attributes has no alternative but to continuously meet the SERVQUAL criteria as this type of characteristics forms the essence of the offering and therefore should be considered a non-negotiable attribute.

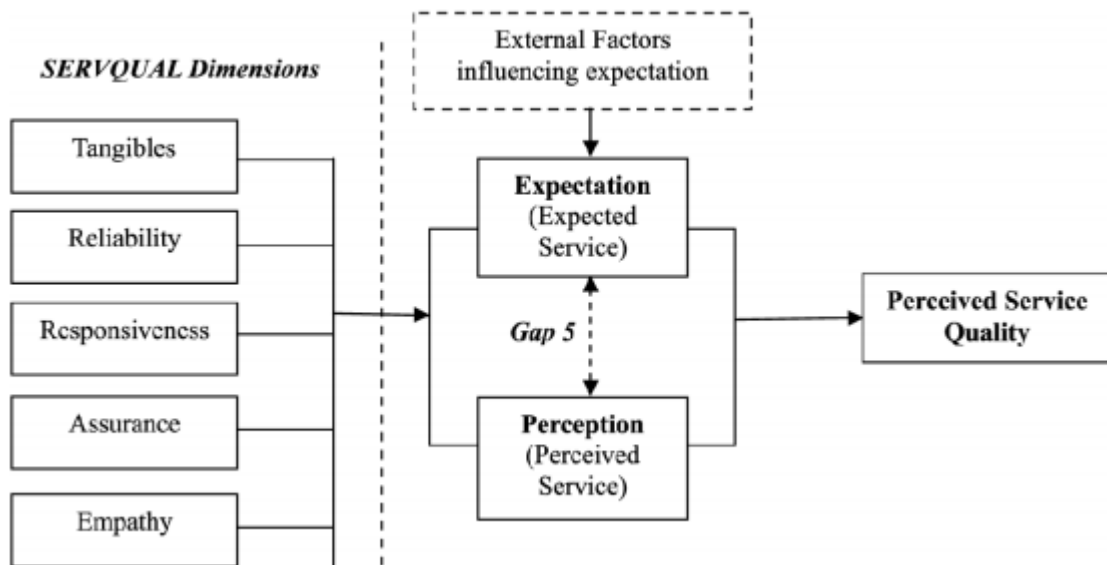


Figure 4 SERVQUAL model

Source: Parasuraman et al. 1988)

Gorla et al. (2010) hypothesises that service quality has a strong link to organisational impact as they deem the delivery of high service quality as a precondition for organisational success that leads to customer loyalty, customer satisfaction and financial success.

The theoretical framework being applied uses the three quality dimensions as the platform or foundation of the physical system deliverables. As previously mentioned, these dimensions will be considered as a mechanism that has been delivered as a result of investment into the SST concept and will be used as dimension to understand the relationship between investment into SST's and the impact on the organisational performance.

System Use or 'Intention to Use'

Delone and McLean (2003) vehemently defended their stance, in the review of their IS success model, contending that system use was a critical measurement in the framework due to its impact on organisation performance. This metric was considered causal in relationship as a predecessor to organisational impact but was not the only linkage in the model.

The same view was iterated by Delone and McLean (2003) from an e-commerce perspective as this entire dimension becomes a voluntary interaction based on the usefulness of the system. This dynamic however, places huge importance on this measurement construct as it plays a pivotal role in the measurement of holistic IS success in the context of this research.

Considering the debate surrounding the inclusion of system use in the model, Petter et al. (2008) described the dimension as the extent to which the customer utilises the capabilities of the system in order to achieve their required outcomes and expectations. Examples of these are frequency of use, appropriateness of use, extent of use and the like.

The measurement of use has not yet been agreed upon based on the research carried out to date. Petter et al. (2008) highlights that the most appropriate measure of use to date is that of frequency of use; however it may not be the most accurate. This metric is being used in the interim until a more accurate model is derived.

Bobbitt and Dabholkar (2001) highlighted that technology based self-service facilities were not necessarily adopted by all users as there was a varying level of acceptance for self service. The research informed both marketers as well as technology service providers from a client attitudinal perspective, due to the fact that there was no comprehensive framework to understand or predict why these facilities were used or not. It was concluded that firms offering technology based self-service facilities must ensure that their offering considered the identification and remedying of attitudinal negativities in adoption, identifying and demonstrating mitigating factors associated with perceived risk and finally, providing the necessary amount of information to ensure a holistic interaction without the risk of having to source information elsewhere.

These attitudinal factors were considered from a different perspective by Meuter & Roundtree (2003), whereby the aspect of 'control' was researched with findings that suggested that consumers sensed a feeling of independence when using SST facilities and therefore increased their usage and 'intention to use' as the quality of the system components improved. The results of the study suggested that users of SSTs with high apprehensions toward technology use as a result of its perceived navigation rigidity and structure, particularly in the financial services and banking sector, may be disposed to adopting as they feel powerless to alter the process if required.

It is therefore imperative that attitudinal elements are considered when promoting usage within a SST environment as it will determine the impact of success of the system in relation to organisational performance.

In the previous section, it was noted that the internet and automated teller (ATM) banking usage statistics dwarfed that of the actual teller interactions by a ratio of 20:1 (Sustainability Report, 2011). In the results of a separate study conducted in Alice, South Africa, it was documented that 94% and 98% of Standard Bank and First National Bank clients respectively acknowledges the advancements in technological innovations such as ATMs, cellphone banking and internet banking (Musara & Fatoki, 2010). Of these respondents, 50% acknowledged that ATMs have provided the greatest contribution to banking improvements and efficiencies.

These statistics are indicative of the adoption and usage of the SST facilities available in this sector and begins to highlight the fact that the sector may be in a position whereby they have considered the attitudinal elements associated with the use of SSTs.

User Satisfaction

Pérez-Mira (2010) deduced that user satisfaction would be the preferred independent variable in the measure of IS success if it were to consider the non-associative relationship with the system or organisation. This dimension assesses the system's ability to deliver what is expected by the user based on the organisation's intended use for that system. Petter et al. (2008) defines user satisfaction as the user's satisfaction with the system processes and outputs.

DeLone and McLean (2003) considered the measurement of user satisfaction success as an important dimension as it measures customer opinions and should cover the entire customer interaction process. They have also listed critical metrics from an e-commerce perspective such as 'repeat purchases', 'repeat visits' and 'user surveys'.

In a separate study, Chung and Kwon (2009) researched the underlying reasons for the slow adoption of mobile banking in Korea that consisted of a 44.7 million internet banking subscriber base with only 3.5% of transactions being conducted via mobile devices. Their research highlighted the fact that customer satisfaction had a direct correlation with 'trust'. If any system, new or existing, demonstrates all the quality aspects, namely system information and service quality, then users are more likely to adopt the SST or mobile facility as it offers them a sense of trust.

Hsieh (2005) builds on this finding by raising the view that customers are always seeking out opportunities and very often organisations do not attempt to understand the needs of their customers and hence creates misalignment of objectives. Hsieh (2005, p79) states that "What the customer expects and what he perceives he gets has a great impact on their

satisfaction or dissatisfaction and their propensity to return to your service or to seek alternatives from competitors”.

User satisfaction then positively increases the adoption of the system and customer loyalty, resulting in longer term relationships that definitely will affect the organisational performance in the process. As Hsieh (2005) iterated, if the customer is not understood, the reverse may also be a possibility.

Based on the views expressed by the studies mentioned it is evident why these researchers consider the user satisfaction dimension measure to be one of the more critical metrics in the DeLone and McLean model of IS success (2003).

2.5.2. Organisational Impact and Performance

Purely from an information technology perspective, Jacks & Schilhavy (2011, p854) quotes “IS makes an organisation successful by either making the organisation more profitable, more productive, or by an intangible benefit”. This statement aligns itself with the objectives of the organisational impact and performance dimension which is considered to be the second primary variable of the DeLone and McLean model of IS success (2003).

According to Pérez-Mira (2010), the organisational impact or net benefits dimension of the DeLone and McLean model of IS success (2003) is more commonly studied in association with the individual impact perspective. In her studies, she applied it successfully to the impact on e-commerce from an organisational perspective. As an object of this study, a similar approach will be followed whereby the organisational performance will be the focus and not the individual impact.

In addition the study will consider the net benefits dimension within the DeLone and McLean model of IS success (2003) as a synonymously associated with organisational performance as they both strive to achieve the same objective, that is to measure the impact as a result of the initial investment in SST. DeLone and McLean (2003) describes the net benefit dimension as the most important of all the dimensions as it encapsulates all the positive and negative influences on the organisation as a result of e-commerce initiatives, and in this case SST facilities. These influences take into account factors such as customers, suppliers, organisations, markets, industries and the like. Sedera et al. (2004), in turn, listed measurement criteria as being organisational costs, cost reduction, overall productivity, increase capacity and business process change.

Petter et al. (2008) mentions that there are a variety of methods measuring net benefits at an organisational level similar to those listed in the previous paragraph. However the most preferred and meaningful measure is profitability. The numerous measures that are being utilised currently causes great difficulty when interpreting the relationship between net benefits and the other range of dimensions, and therefore a lack of conclusiveness may be encountered in the various studies.

Petter et al. (2008) further cautions the approach to measuring profitability as a net benefits indicator by highlighting that the research must be conducted via interviews at the most senior level and not at the user level, or by referring to objective data within annual reports.

Profitability as a measure was studied by Blankley (2006) in an Australian context and the results manifested itself in the form of 38% of firms confirming an increase in profits due to technological innovations while only 7% professed the opposite. This study was conducted across all sectors and provides interesting insights into what effect the innovative SST facilities may have on the financial services and banking sector profitability.

In a study, conducted by Musara and Fatoki (2010) in the South African context, it was determined that 75% of respondents in Alice, South Africa, concurred that technological innovations in the banking sector had resulted in cost savings to the customer. These technological innovations were defined as the advent and optimisation of services and facilities such as ATMs, cellphone banking and internet banking.

Based on the statistical data presented regarding the innovative application and adoption of SSTs, Hsieh (2005) insists that organisation must have a clear strategy regarding the inclusion of SST in their business objectives and strategies. SSTs should not be developed and provided as an additional service to customers for reasons such as organisational cost saving measures or filling a void to keep pace with competitors as this may invoke negative customer attitudes toward these facilities. The objective is to provide a benefit that surpasses those that exist from alternative channels, and encourage customers to adopt them for their benefit while invoking the positive reactions necessary for SST success.

It is evident in the literature that organisational impact or performance cannot be considered in isolation and based on the DeLone and McLean model of IS success (2003), it is clear that this is influenced and impacted by a range of interdependent relational dimensions that shape its outcomes whether in the form of profitability, cost reduction, client experience and so forth.

The following section will review the causal relationship that exists between the two primary dimensions that form the bedrock of this study.

2.5.3. Causal relationships

The DeLone and McLean model of IS success (2003) as mentioned in previous sections of this study is based on six interrelated dimensions that are causally related. These relationships produced 15 ‘pairwise’ comparisons based on the groupings within the model in a study conducted by Petter et al (2008). These ‘pairwise’ comparisons or relationships are depicted in Table 2 below.

System quality	→	System use ^a
System quality	→	User satisfaction
System quality	→	Net benefits
Information quality	→	System use
Information quality	→	User satisfaction
Information quality	→	Net benefits
Service quality	→	System use
Service quality	→	User satisfaction
Service quality	→	Net benefits
System use	→	User satisfaction
System use	→	Net benefits
User satisfaction	→	System use
User satisfaction	→	Net benefits
Net benefits	→	System use
Net benefits	→	User satisfaction

Table 2: Suggested IS success relationships

Source: Petter et al. (2008)

As the primary focus of this study is directed to the relationship between investment in SST and organisational performance or net benefits, the pairwise relationships review and discussion are centred on the quality dimensions, namely system, information and service quality in relation to net benefits. From the relationships pairing in Table 1, there are three primary relationships to be reviewed.

2.5.3.1. System Quality and Net Benefits

The relationship between system quality and net benefits is considered strong at an organisational level (Gorla et al., 2010; Petter et al., 2008; Pérez-Mira, 2010). The quality of data was perceived to be directly related to efficiency and therefore impacting sales when

^a We chose to consider both intention to use and other measures of system use as the same construct for this literature review. Although the DeLone and MacLean model of IS success (2003) did distinguish between intention to use and system use their updated model, intention to use is generally an individual level construct. This is not a concept that is consistent with the studies employing an organisational unit of analysis. Furthermore, by parsing the use of construct into two separate sub-constructs (i.e. intention to use and use), it makes an already complex paper (with 15 pairwise relationships to the analysis). In the discussion of the results of the literature review, we do identify those studies that measure intention to use as opposed to other measures of system use. (Petter et al., 2008)

specifically reviewing an e-commerce platform. The ease-of-use and availability of documentation was listed as important attributes that contributed significantly when considering adoption and loyalty to a SST facility while creating an environment for interaction that triggers revenue generating activities. This relationship is critically important when organisations are measured based on revenue with the financial services or banking sector being aligned to these practices and behaviours. It is therefore imperative to understand that the investment into SST from a service quality perspective will impact the organisation's performance as it influences the revenue levels and ultimately the profitability.

As a result of these findings, it was deduced that there is a perceived strong relationship between system quality and net benefits to support the structure of this research topic.

2.5.3.2. Information Quality and Net Benefits

Gorla et al (2010, p215) stated that "higher information content (i.e. accurate, complete and relevant information) leads to better product cost control and increased organisational efficiencies (i.e. increased profit margins, increased decision making efficiency)". Information quality in the SST perspective aligns itself to this view as information in the financial services or banking sectors is key to customer decision making.

Petter et al. (2008) projects a marginally differing viewpoint as they believe that the relationship between information quality and net benefits are moderate mainly as a result of how it is being measured. These finding suggested that information quality did not have a significant impact on productivity, competitiveness and management improvement which contrast somewhat with Gorla et al (2010).

Considering the two viewpoints, a relationship exists between information quality and net benefits at an organisational level with both researchers not negatively discounting its impact on profitability. This relationship has not been sufficiently researched and further studies are required to establish whether there is a significant, moderate or low impact on net benefits and organisational performance (DeLone & McLean, 2003; Gorla et al, 2010; Petter et al., 2008; Pérez-Mira, 2010).

2.5.3.3. Service Quality and Net Benefits

Service quality is the least examined quality dimension in relation to organisational impact. Although both Petter et al. (2008) and Gorla et al. (2010), whom have contributed immensely to this success dimensional relationship study, iterate the fact that there is not enough

evidence to support what they believe is a moderate relationship between service quality and net benefits or organisational performance.

In view of the research topic being addressed, the lack of evidence in this particular relationship should be considered as a research component within the SST context. Figure 5 below demonstrates the ambit of research that has been undertaken by various academics based on Petter et al. (2008) findings.

Although this study focusses on the primary relationships as mentioned throughout this paper, there is enough evidence to suggest that a significant amount of research is still required to fully understand the extent to which the other dimensions impact each other, for example the user satisfaction relationship to net benefits and so forth. The research being undertaken will focus on but not be limited to the primary relationships and therefore the possibility of providing insights to these may exist.

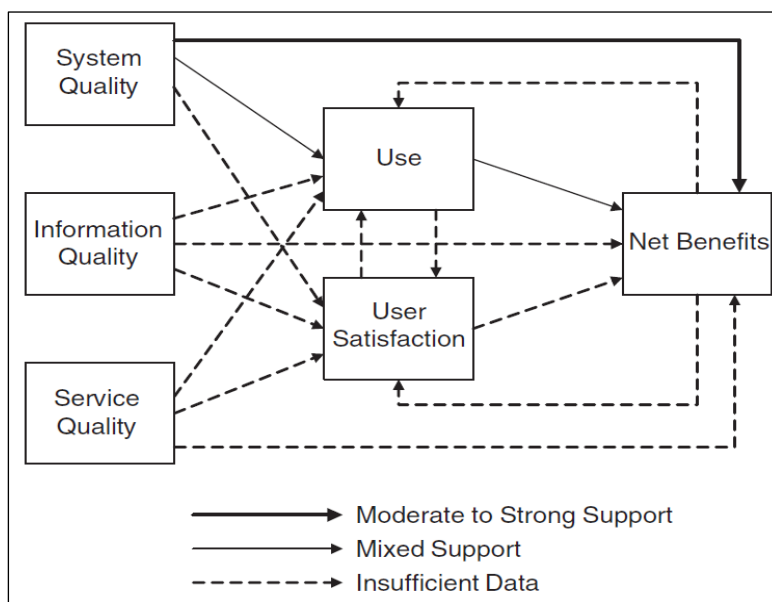


Figure 5: Support for interrelationships between D&M model of IS success (2003) dimensions at an organisational level.

Source: Petter et al. (2008)

2.6. Summary

At present there is an unprecedented race by organisations in various industries to transform their business from a highly interpersonal business model to that of a self-service model.

There are many reasons why the transformation to a self-service model is beneficial to both

customers and organisations, such as customer 'control' processes, reduced processing cost and increased profitability to name a few.

The financial services and banking sector has not been isolated from this self-service model with an IT-based adoption becoming the primary channel for their customers. The adoption of these self-service technology (SST) facilities has grown in the past decade with facilities such as Automated Teller Machines (ATM), internet banking and cellphone or mobile banking. The South African financial service and banking sector is no different and has embraced these SST channels. Considering the advent of the SST facilities and the continued investment into these channels by the various financial institutions, it is therefore important to understand how this will impact on organisational performance.

Over the past three decades, SST adoption had evolved from high levels of apprehension by users and organisational management alike in the early 1980s and 1990s to that of acceptance and perceived benefit in the current decade. Organisations progressed past the notion that SST channels would replace the branch channel, and acknowledged that investment into this channel must form part of a business strategy in order to generate organisational performance.

From a global perspective, the western regions, namely North America and Europe, have portrayed a high level of adoption of SST channels with advanced levels of user interaction, coupled with organisations including it as a strategic offering within its greater business strategy. In contrast, the eastern and African regions portray varying challenges impacting adoption from societal factors such as cash societies to attitudinal or psychological factors which are mainly risk, trust and awareness based. South Africa, although it forms part of the region, do not share in all the mentioned challenges, however it has an industry that overlaps with western, eastern and African complexities and maturities where applicable.

Further theoretical research based on the DeLone and McLean model of IS success (2003), highlights that there is not enough evidence to suggest that investment into the SST components including system, information and service quality will equate to positive organisational performance or net benefits such as increased profitability, cost reduction and the like.

Petter et al. (2008) highlighted that there is still a significant amount of research to be conducted in this field, from a generic information technology perspective. However, considering this study and the lack of research in the abovementioned field, it will be necessary to align the research to that of the SST channel.

As a result of the evidence presented in this literature review, it is evident that the research question of 'how does investment into self-service technology affect organisational performance in the South African financial services industry?' is relevant as there is no conclusive evidence based on previous research to prove otherwise.

3. Research Methodology

3.1. Introduction

Myers (2009) refers to the research design of any research project as a 'roadmap' that is based on a plan with a logical progression of aspects that allows the research to be completed in a methodical and compliant manner. Saunders, Lewis and Thornhill (2012) concurs with this description however they highlighted that the research design must include the objective of the research project in relation to the research question that require answering. To support their standpoint, Saunders et al. (2012) outlined an academic research framework that requires adherence in order to maintain a degree of rigor and is depicted as the 'research onion' in figure 6 below.

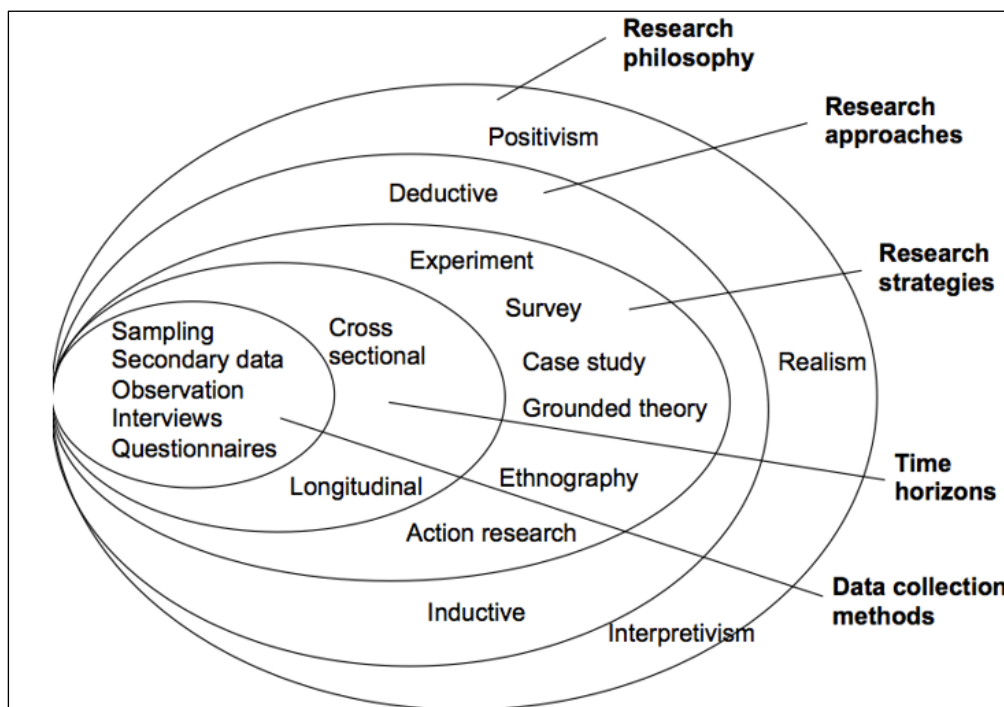


Figure 6 Research Onion

Source: Saunders et al. (2012, p137)

The research design, methodology, data collection and analysis therefore consists of a consequential structure that drives both the focus and outcomes of this study. The dimensions of the structure and the reasoning behind the decisions are delineated in the sections that follow.

3.2. Summarised research method outline

Table 3 below provides a summarised outline of the research approach that the researcher selected in order to complete this research project within the required framework. As mentioned above, all the dimensions outlined in table 3 will be substantiated within the following sections of this chapter.

METHODOLOGY	APPROACH
Research philosophy	Post-positivist
Research purpose	Explanatory
Research approach	Deductive
Research strategy	Case study
Time-frame	Cross sectional
Data collection approach	Qualitative
Research instrument	Semi-structured interviews
Target population	A national banking institution within South Africa
Sampling	Purposive sampling
Data analysis	Thematic analysis

Table 3 : Research methodology summary

3.3. Research Philosophy

Saunders et al. (2012) describes research philosophy as the ‘development’ and ‘nature’ of knowledge in the context of an all-encompassing set of characteristics that informs and steers towards the research objectives. Orlikowski & Baroudi (1991) in their initial research highlighted that information technology research generally followed a similar set of philosophical conventions. However the researcher, based on their application of the philosophies, may achieve the research objectives and outcomes of this study by deviating from the perceived norm.

In order to contextualise the philosophical positions within this study, the following phenomena were considered as the basis for departure when determining the structure of the research design.

3.3.1. Epistemology

Chua (1986, p622) defined epistemology as the “beliefs about knowledge”. Chua (1986) further elaborated on the definition by highlighting that it was a theoretical assessment of information or knowledge that was indicative of its present scenario. Hence, a common alignment with case study research methods. Orlikowski & Baroudi (1991) stated that epistemological research methods are considered the ‘dominant perspective’ in information technology research when compared to the ontological methods. These findings emphasise that evaluation of knowledge constructs are more appropriate within the information technology research context than social and physical reality.

Saunders et al. (2012) listed three epistemological categorisations, namely positivism, interpretivism and realism, while Orlikowski & Baroudi (1991) included critical theory as the third in their interpretation. A critical realist philosophy will be considered as the third categorisation referenced by Saunders et al. (2012) and Orlikowski & Baroudi (1991).

3.3.1.1. Interpretivism

Interpretivism is associated with the subjective and inter-subjective assessment of the interactions of a study or research subjects and their environment. This form of research philosophy is considered an interpretivist ‘paradigm’ if the study subjects are interviewed to gather information after which the interviewer’s subjective perceptions are applied to the responses to determine the outcomes (Bhattacharjee, 2012; Orlikowski & Baroudi, 1991).

Saunders et al. (2012) highlights that a crucial characteristic of interpretivism is that the researcher must enter the subjects social ‘world’ in order to observe and understand the phenomena or behaviour being displayed in order to take a definitive stance. This type of research is usually aligned to the field of organisational behaviour and various aspects of functional management.

Considering the objectives of this study namely understanding the impact and relationship between investing into SST and its impact on organisational performance, it is evident that there will not be a need to subjectively study subjects in their social environment in order to determine social order.

3.3.1.2. Positivism

Bhattacharjee (2012, p8) contrived to suggest, based on historical philosophy, that “theory and observations have circular dependence on each other” which constitutes the foundation of the positivism philosophy. Further to this Orlikowski & Baroudi (1991) iterates that these studies are based on the fact that there are pre-existing ‘piori’ relationships within the phenomena that is being researched via the use of well-defined methods. Positivistic research methods tend to follow a strict order in terms of adherence to association with ‘factual’ and ‘trustworthy’ knowledge that is objectively gathered and interpreted which is quantifiable.

Dikow, Hasan, Harald, Kosch, Brunie & Sornin (2013) highlights that knowledge and information, particularly from an information technology perspective, is readily available within most environments with the ability to have phenomena investigated and interpreted objectively. Orlikowski & Baroudi (1991) concurs with this observation by inferring that positivistic research philosophies were identified as the ‘dominant research perspective’ in information systems research. Their findings are evident in table 4 below as 96.8% of information systems research use the positivist philosophies in their research design and methodology processes.

Epistemology	Frequency	Percent
Positivist	150	96.8
“ <i>descriptive</i> ”	(37)	(23.9)
<i>theoretically grounded</i>	(113)	(72.9)
Interpretive	5	3.2
Critical	0	0
	155	100%

Table 4: Dominant research perspectives in information systems research

Source: Orlikowski & Baroudi (1991)

This research project will require a subjective interpretation of non-social phenomena as well as the understanding of a causal relationship between the two constructs. Considering this, it would be difficult to align this study to a pure positivist philosophy as the possibility of strict

adherence to absolute 'factual' information gathered and interpreted objectively is not possible. This method follows a quantifiable approach and does not foster subjectivity. Understanding the causal relationship between investment into SST and its impact on organisational performance will require subjectivity from the subjects or participants and cannot rely on absolute 'factual' information.

3.3.1.3. Critical Realism

Chua (1986, p619) described critical research philosophies as:

Critical research argue that because any finite thing is both itself and its opposite, things taken as isolated particulars are always incomplete. The particular exists only in and through the totality of relations of which it is a part. Therefore, what a finite thing is and what it is not may only be grasped by understanding the set of relations that surround it.

Bhattacharjee (2012) corroborates and further expands on the description of critical research philosophy, by introducing the critical realism research philosophy that pre-supposes that there is an 'external reality' that exists outside of human intelligence. Critical realism therefore embraces the notion that phenomena are multi-dimensional with both a direct and indirect or subliminal reality.

Bhattacharjee (2012) further deduces that critical realism is associated with post-positivism. Lapid (1989, p239) defines post positivism as a "loosely patched umbrella" that allows for non-conformist application of philosophy in contrast to that of positivist which adheres to a 'simplistic' structural platform. This philosophy allows research projects to subjectively observe and interpret phenomena in a less restrictive manner. Bhattacharjee (2012) further embellished the post positivistic philosophical concept by stating that it is a combination of observations and 'logical reasoning' with a 'probabilistic' outcome that allows for various possibilities.

Henning, Van Rensburg and Smit (2004, p17) provides a non-stereotypical view that aligns with the research objectives by stating that "In post-positivist work emotions are captured, for example, in interviews, and then coded and categorised into groups and meanings. Reality, which is assumed, is therefore not necessarily measured, but described in a systematic way".

This statement supports the researcher's anticipation of the type of knowledge results that this study is expected to deliver, via an epistemology or the 'nature of knowledge', using a critical realist influence that incorporates a 'pseudo-interpretivist' type (Gregg, Kulkarni & Vinzé, 2001) viewpoint as well.

As a result of the views expressed in this section, there is enough theoretical support to suggest that this study will align itself to a non-stereotypical post-positivist approach, as the study attempts to understand the effects of two variables being researched in a possible causal relationship while being measured in a systematic way. The variables will objectively be studied as part of the data collection and analysis process with no expected research result.

3.4. Research Purpose

The research purpose of a research design or method have three categorisations, namely explanatory, exploratory and descriptive (Bhattacharjee, 2012 & Saunders et al., 2012). These categorisations are applied in relation to the objectives of the research in terms of whether a phenomenon is being explored, explained or described.

Bhattacharjee (2012) deduced that exploratory research is associated with the study of new phenomena where the initial decisions are made around the magnitude, ideation and viability of the research exercise objectives and goals. Exploratory research is therefore a research method that is used to determine and understand new phenomena as well as new or recent trends in existing phenomena. Bhattacharjee (2012) & Saunders et al. (2012) provided further insights by iterating that exploratory research should be considered as the 'precursor' for future in-depth research on a new phenomenon.

When considering the focus of this research project, whereby two phenomena namely investment in SST and organisation performance, as well as a causal relationship that already exists, it is evident that the alignment to an exploratory research method is improbable or impractical as no precursory research will be required.

Descriptive research is considered to be the mechanism that accurately depicts characteristics and/or attributes of phenomena or profiles of persons, events and the like Bhattacharjee (2012). Saunders et al. (2012) also considers descriptive research as a forerunner to either exploratory or explanatory research as it solidifies the understanding of the researcher towards the topic or phenomena being studied. Considering the context of the study being conducted, the descriptive research method will provide a similar misalignment as the exploratory research method due to its precursory nature.

Explanatory research differs from descriptive research in terms of its targeted objectives, which are seeking answers to the functioning of a phenomenon as opposed to examining attributes of phenomena. This type of research is based on explications of observable phenomena while it is strongly associated with causal and case study research strategies (Bhattacharjee, 2012).

Saunders et al. (2012) therefore confirmed that a research project or a study that establishes a causal relationship between two variables would be considered an explanatory study. This study primarily attempts to understand the relationship between investment in SST and the impact on organisational performance. One of the outcomes of this study would be to determine whether there is a strong link between the two variables as mentioned in the sub-objectives. This relationship will also be contextualised within the South African financial services industry.

3.5. Research Approach

Saunders et al. (2012) notes that a theoretical approach may either test theory or develop theory. This research project would best be suited to testing theory via data collection as there are a number of theories that are structured around information systems benefits and success. As a result of this, the study will adopt a theory based deductive approach.

Based on the objectives outlined in previous sections of this paper, the researcher found it appropriate to adopt and adapt the updated version of the DeLone and McLean model of IS success that has been applied extensively in IS literature (DeLone & McLean, 2003).

In the literature review conducted for this study, Pérez-Mira (2010) observed that the DeLone and Mclean model of IS success has rarely been used for organisational level analysis of success; however it was used as the basis for the analysis of e-commerce in her research and therefore supports the appropriateness of the framework for this study.

The model consists of six interrelated categories (see Figure 7) that has its foundations based on information quality, systems quality and service quality with an impact on the use of a particular system and in this case SSTs. The 'use' then affects or impacts the net benefits pertaining to organisational performance in many aspects including profitability as a result of increased sales, cost reduction, improved productivity and the like.

It may be necessary to retrofit this theoretical framework to meet the required objectives of this study. The organisation's capital investment into the SSTs will be accepted and considered as part of the foundational dimensions, namely the information quality, the

systems quality and the service quality. These dimensions will form the basis of the research project as it is presumed that capital expenditure had taken place and that there are operational activities that are being supported by this technology for commercial sustainability.

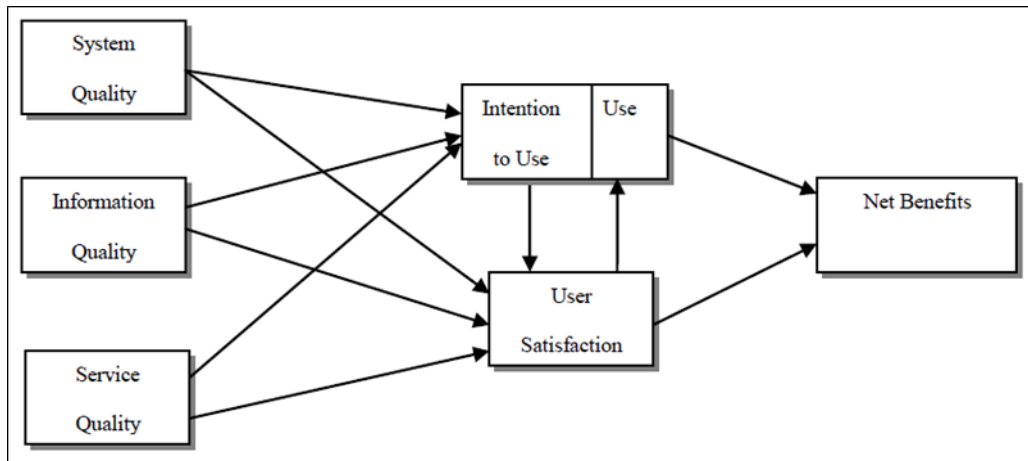


Figure 7: Updated DeLone & McLean model of IS success (2003)

Therefore the capital investment in the quality dimensions and its causal relational impact on the net benefits or organisational performance is the focus of the research.

3.6. Research Strategy

Considering the various research strategies available, this phenomenon as mentioned above, has not been exclusively researched nor understood yet, and therefore the study may be conducted within a single entity. In addition to this, Darke, Shanks and Broadbent (1998, p273) states that “case study research is the most widely used qualitative research method in information systems research, and is well suited to understand the interactions between information technology-related innovations and the organizational context”. Benbasat, Goldstein and Mead (1987, p370) further endorse the case study strategy by defining it as follows, “A case study examines a phenomenon in its natural setting, employing multiple methods of data collection to gather information from one or a few entities (people, groups, or organisations)”.

Based on the literature, case study strategy is the most widely used qualitatively to understand the organisational relationship within technological environments of an entity or entities. It is therefore evident that this research strategy would provide the appropriate structure for this study as it aligns itself with the objective of understanding the causal

relationship between two primary variables namely the investment in SST and the impact on organisational performance within an entity.

The case study will accommodate a single-case design method by testing a well formulated theory using a single organisation as the unit of analysis. The site selection for the single case method is KBN Bank, a multinational financial services banking institution domiciled in South Africa that contributes significantly to the direction and competitiveness of the country's financial services landscape.

An alternative research strategy would be that of ethnographic research which centres around field studies with a particular emphasis on description and interpretation or explanation that allows for the restructuring and/or reclassification of social reality in order to retrofit it into existing theoretical models (Goetz & Le Compte, 1981; Saunders et al. 2012). This research method is primarily quantitative and relies on techniques such as sociometric analysis that measure social relationships.

The case study strategy was considered above the ethnographic theory mainly for the reason that the study did not necessarily rely heavily on human, social or cultural insights regarding aspects of the organisation but merely a relationship between the primary variables of technological and economical substance.

3.7. Timeframe

Leedy & Ormrod (2001) highlighted that researchers may test their statistical or research data over time in order to determine its relevance, or as a measure of change within a study group or groups in order to conclude an outcome. There are two types of research design methods that constitute the time frame or horizon aspect of a research project, namely longitudinal and cross sectional.

A Longitudinal study is where research is carried out on a study group over a period of time, for example developmental aspects of child growth at various ages. This type of research usually takes place when there are no time constraints on the research exercise or the nature of the research is time based (Saunders et al. 2012).

The cross sectional study is directed at a 'snapshot' or point in time reference where study groups or phenomena are compared and measured against each other (Bhattacharjee, 2012). Cross sectional time frames are commonly used in qualitative data collection methods where interviews are being conducted.

This research project will adopt a cross sectional timeframe as the research objective is to understand the relationship that exists between investment in SSTs and its effect on the organizational performance. In addition to this, due to the time constraints imposed on this research project it is prudent to adhere to a cross section study as the phenomena being researched will be measured on a 'snapshot' basis.

3.8. Types of Data and Analysis

Benbasat et al. (1987) referenced the definition of a case study as an examination of information gathered on a fact or facts of an organisation via the use of data collection methods. This definition, as quoted earlier in this document, aptly provides the platform and structure for the data collection and analysis approach as follows.

3.8.1. Data Collection Approach

Saunders et al. (2012) & Bhattacharjee (2012) identified three different data collection methods, namely quantitative, qualitative and mixed method.

Leedy & Ormrod (2001, p102) stated that "Quantitative researchers seek explanations and predictions that will generate to other persons and places. The intent is to establish, confirm, or validate relationships and to develop generalizations that contribute to theory". Williams (2011) further conpires by highlighting that quantitative research methods is a mathematical approach that involves statistical analysis of data collected via surveys. The research process is objective and carried out independently of its subjects or participants (Williams, 2011). This method of research is generally used to test hypothesis of which there is a large amount data to be sourced.

This research project is aimed at understanding a relationship between two variables namely investment into SST and organisational performance as well as the nature of their relationship. Considering this, there will be a requirement for subjective data collection as the participant have to provide significant insights into the strategic reality and nature of the constructs being studied. Therefore, the quantitative research method, based on its 'purely' objective nature will not be suitable for this research project.

Williams (2011, p67) stated that "qualitative research is a holistic approach that involves discovery". Bhattacharjee (2012) reverts to qualitative research as 'non-numeric' in nature and states that this form of research generally unearths unpredictable or unexpected insights due to its open-endedness. As a result of its subjectivity, qualitative research relies on 'face-to-face' data collection instruments and therefore holds the subjects or participants as the focal point of the data gathering process.

Myers (1997, p242) stated that “In Information Systems, there has been a general shift in IS research away from technological to managerial and organisational issues, hence increasing interest in the application of qualitative research methods”. Williams (2005) further elaborates on the previous statement by alluding to the application of qualitative research as the mechanism for researching information from a social perspective via the participants view point. These perspectives provide the necessary support for the data collection approach for this study.

Considering that the underlying research objective is to understand the impact of investment in SST on organisational performance, postulating that the study is organisational in nature, it would therefore be pragmatic to align it to a qualitative data collection research method.

Therefore the comprehensive approach for this study will take the form of a qualitative research approach incorporating an underlying epistemology of a post-positivistic influence while testing the selected theoretical framework, with the objective of unearthing a predictable set of outcomes without initial expectations.

3.8.2. Research Instrument

Bhattacharjee (2012) confirmed that the most common data collection method associated with case study research are interviews. Saunders et al. (2012) identified a ‘topology’ of three different interview types, namely structured, semi-structured and unstructured or in-depth interviews. Structure interviews are commonly used in quantitative research where responses are coded for statistical purposes. Similarly, unstructured or in-depth interviews are associated with qualitative analysis however, it aligns more to ‘grounded’ theory research strategy which constructs theory as opposed to this research project that is testing theory. For the purposes of this study, the researcher will not be considering structured or unstructured interviews as they do not align to the research strategy and methods justified in the earlier sections of this paper.

Williams (2011, p69) proposed from a qualitative research method perspective that “the method of collecting data is through lengthy (1-2 hours) interviews in order to understand and interpret a participant’s perception on the meaning of an event”. In support of this proposal and with relevance to this study, Petter et al. (2008) further cautions the approach to measuring organisational performance by highlighting that the research must be conducted via interviews at the most senior level and not at the user level, or by referring to objective data within annual reports.

The instrument of data collection for the purpose of this study will be a series of semi-structured interviews with different participants in order to allow for any additional insights from the interviewees that may provide a foundational comprehension for attaining the research objective.

The data collection process will be based on the components or categories outlined in the DeLone and Mclean model of IS success theory referred to earlier in this document. These components will form the basis of the questions in the interview processes as referred to in appendix A of this document

3.8.3. Target Population

When commencing with the data collection aspects of a research project, there are always concerns around the quantum of data sourced (Neuman, 1994). This research project, as mentioned in previous sections will draw its sample from within a single organisation.

Considering the ambit of the research objectives, this study will be domiciled within the South African borders and be confined to the financial service industry. The target population will therefore be sourced from the single organisation that will be selected within the context described above.

The target population for the data collection process will consist of various senior stakeholders within KBN Bank. Once the target population has been established, the next step in the process would be to identify criteria to select a group of participants that would yield the sample set. This step is termed 'sample framing' (Bhattacharjee, 2012). The sample frame will comprise of senior management, including a few executive members, who will help to determine the impact on the organisational performance of KBN Bank. The reason for selecting a sample from this target population is that they would have access to the strategic motives and direction for investment in SST while understanding its impact on the net benefits of the organisation.

The findings of this research will provide data to make generalised deductions regarding the realization of the research objectives.

3.8.4. Sampling

Saunders et al. (2012) and Bhattacharjee (2012) inferred that there are two groups of sampling techniques that may be used in a research process, namely probability and non-probability sampling. Probability sampling ensures that all subjects or participants have an equal probability of being selected.

The non-probability sampling alternative is less scientific and the selection process is considered to be random and based on convenience in certain instances. As a result of the nature of non-probability sampling, no validations such as sampling error management are possible, however it may be exposed to ‘sampling bias’ (Bhattacharjee, 2012). Non-probability sampling have a variety of techniques such as quota, purposive, volunteer and haphazard (Saunders et al. 2012).

Case research strategies are very often based on generalisations according to Flyvbjerg (2006). The researcher found it appropriate to conduct a purposive sampling technique, based on a target population that will contribute to a generalised outcome that is aligned to the components of the theoretical framework model. Purposive sampling is also known as ‘judgemental’ sampling where the researcher uses their own discretion and judgment to determine both the sample composition and the sample size (Fossey, Harvey, McDermott, Davidson, 2002). Fossey et al. (2002) further noted that purposive sampling’s aims to select the appropriate sources when there is a research requirement to investigate and explore phenomena on a theoretical basis. Tongco (2007) further describes purposive sampling as a technique that relies on the knowledge and insights of a specific set of experts.

This research project is favourably aligned to purposive sampling as it test theory, leans strongly towards subjectivity and will have a small selected sample set that will provide insights to formulate conclusions based on generalisations.

Interviewee	Location	Role in Organisation
Interviewee A	Cape Town	CIO Wealth Division
Interviewee B	Johannesburg	Retail Division: Head of Mobile & Digital
Interviewee C	Johannesburg	Executive Head: Retail Banking and Wealth
Interviewee D	Johannesburg	Executive: GT Strategy, BI & Tools
Interviewee E	Johannesburg	Head: Group Innovation
Interviewee F	Cape Town	Group Executive: Strategy
Interviewee G	Cape Town	Chief Operating Officer: Asset Management
Interviewee H	Cape Town	Chief Operating Officer: Wealth Division

Table 5 : List of interviewees and related roles

The aim of this process would be to interview 8 senior executives in KBN Bank as they will be considered experts in the financial services industry by virtue of the position that they fulfil. The list of the participants and their levels within the organisation is tabulated in Table 5 and aligns to the sampling technique outlined in the descriptions above.

3.8.5. Data Analysis

Anfara, Brown & TL Mangione (2002, p31) description data analysis as:

The purpose of analysis is to bring meaning, structure, and order to data. Confronted with a mountain of impressions, documents, transcribed interviews, and field notes, the qualitative researcher faces the difficult task of making sense of what has been learned.

This description of data analysis succinctly provides a framework for consideration of when constructing the various component for this research based on the research philosophy outlined in the previous sections. The researcher chose to apply a thematic analysis approach (Braun & Clarke, 2006) while considering some aspects of grounded theory namely, open coding and axial coding (Strauss & Corbin, 1998; Saunders et al., 2012).

3.8.5.1. Data Analysis process

The data analysis process followed three phases, namely data transcription, thematic analysis and validations. Each of these data analysis process phases are described in more detail in the following section.

Data transcription

The data was transcribed by a professional research transcriber into an electronic document in a Microsoft Word format. The researcher then validated the transcribed data against the interview audio files that were recorded on both Media players, namely the primary and the backup. This process took place soon after each interview in order to build the data collection, understand the volume of data and find the most appropriate format of preparing the data for analysis (Braun and Clarke, 2006).

The data collection results were collated, recorded and analysed using qualitative methods based on documented interview transcripts.

Thematic analysis

Once the interview transcripts were documented, a thematic analysis approach was followed to perform the data analysis process. Braun and Clarke (2006, p6) define thematic analysis as “a method for identifying, analysing and reporting patterns (themes) within data”. This type of analysis is widely associated with qualitative research methods and utilises a coding

technique in the process of dividing the data into meaningful analytical units or themes (Braun & Clarke, 2006).

The thematic analysis approach is a widely used method of data decomposition that places emphasis on categorising data collected via a qualitative method. Considering the qualitative approach and data collection methodology that this study has adopted, the thematic approach proved to be an appropriate technique to decompose the collected data.

Braun & Clarke (2006) further broke the thematic analysis approach down into six detailed phases in order to methodically analyse the data that has been collected. The next section will outline how the researcher would apply the phases to this study.

- ***Phase 1: familiarising yourself with your data***

This phase centres on ensuring that the researcher familiarises themselves with the data that has been transcribed. If the data has been professionally transcribed by another party, then this will provide another opportunity for the researcher to ensure that the data has been transcribed accurately and meets the format that is required for the analysis (Braun & Clarke, 2006).

This research exercise made use of a professional transcriber and the researcher reviewed and reconciled the completed transcribed data against the audio files that were saved for reference and back up purposes. This process allowed the researcher to familiarise himself with the data that had been transcribed for the next phase of the analysis.

- ***Phase 2: generating initial codes***

This phase assume that the data collected is understood by the researcher. The researcher will identify the initial lists of ideas and document them in relation to the data being reviewed. This process will allow the researcher to perform a data reduction exercise by simplifying the data and codifying it in its simplest form. Within this process of thematic analysis, aspects of grounded theory could be leveraged such as the 'open' coding method whereby codes are determined by the date, also known as in vivo coding, as well as code and terms listed in the literature researched (Strauss & Corbin, 1998; Saunders et al., 2012). The researcher will ensure to retain codes that are not aligned to the primary theme of the research topic.

The researcher's first step of the coding process was to convert all the transcripts into a Microsoft Excel format from a Microsoft Word format. Once all the data was accurately transposed into the Microsoft Excel format, the researcher arranged all the data as follows:

- Grouped into the chronological order of the semi-structured questions that were based on the theoretical framework that was followed within the interview process (appendix A). An example of a semi-structured question is "Does the organisation have an investment strategy for SST?", then
- Aligned each of the respondents' responses to the relevant question groupings above. An example of a respondent's response was "the answer is yes we do ... it's one of the strategic directives of the bank". Then,
- Coded each of the responses in a simplified coding process and thereafter labelled and contextualised the codes on an 'open' coding basis. An example of a code for the above mentioned example would be '1YA' denoting that an investments strategy exists and that respondent A confirmed that.

This process was applied by the researcher in order for the researcher to progress to the next phase of the process.

- ***Phase 3: searching for themes***

The researcher will identify themes based on the codes that have been discovered in the initial analysis of the data collected. Themes differ from data as themes are focussed on the meaning of the data in the form of phrases and the like while coding is a process that relies on tagging or identifying similar data points derived from the data. Relationships between the themes and codes are identified within this phase.

To complement the thematic analysis approach, the researcher elected to leverage and apply the grounded theory method of axial coding (Saunders et al. 2012). Saunders et al. (2012) described axial coding as the process whereby relationships are identified between the categories or themes of data with particular focus on the impacts on the primary constructs in terms of why and when, as well as the environmental factors such as political, economic, technological and the like. At this stage, the research will have significant understanding of the themes based on the initial coding.

The researcher applied the thematic alignment of themes in order to categorise similar themes as well as identifying relationships between them. An example of these were that in order for an investment strategy to exist for SSTs within an organisation, the presence of

strategic drivers were required based on the common themes derived from the responses of the respondents.

These themes and relationships between them were grouped by the researcher and ordered for reviewing.

- ***Phase 4: reviewing themes***

This section focusses on the review of themes and expects the researcher to identify themes in two stages. The first stage of revision centres on identifying and finalising those themes that are coherent with the research objectives. The second stage focusses on the development of the thematic map and the validation thereof to confirm that all the data is accurate and comprehensively encompassed.

Both these stages were carried out by the research resulting in the thematic map that is represented in the layout of the findings in the Data Analysis and Findings section of this research document.

- ***Phase 5: defining and naming themes***

This stage targets the further refinement and finalising of all the themes and/or sub themes in the thematic map. The researcher will ensure that the essence of each theme is fully understood and therefore be in a position to accurately relate or construct a story of the underlying meaning of the data categorised in each theme.

The researcher refined the thematic map and finalised the each theme based on the groupings of data that existed and ensured accuracy of the composition of the themes.

- ***Phase 6: producing the report***

The final stage of this process entails connecting all the themes into a cohesive story that unearths the findings based on the initial set of data collected (Braun & Clarke, 2006). Braun & Clarke (2006) further describes the 'write-up' stages by stating that "it is important that the analysis (the write-up of it, including data extracts) provides a concise, coherent, logical, non-repetitive, and interesting account of the story the data tell – within and across themes".

The researcher will construct the final data analysis and findings section of this research paper by producing a report that concisely encompasses all the data collected.

The researcher applied the phased approach to the thematic analysis process which is illustrated in table 6 as follows:

Phase	Activity	Artefacts
<i>Phase 1: familiarising yourself with your data</i>	The researcher had: <ul style="list-style-type: none"> • Reviewed transcripts due to it being professionally transcribed. • Familiarised himself with the transcripts in preparation for analysis & review 	The researcher finalised the following: <ul style="list-style-type: none"> • Microsoft Word format transcriptions reviewed against the audio files.
<i>Phase 2: generating initial codes</i>	The researcher had: <ul style="list-style-type: none"> • Converted all the transcripts into a Microsoft Excel format from a Microsoft Word format. • Grouped into the chronological order of the semi-structured questions that were based on the theoretical framework • Aligned each of the respondents' responses to the relevant question groupings above. • Coded each of the responses in a simplified coding process 	The researcher finalised the following: <ul style="list-style-type: none"> • Microsoft Excel spreadsheet that contains data grouped by semi-structured questions, respondent's responses and simplified coding
<i>Phase 3: searching for themes</i>	The researcher had: <ul style="list-style-type: none"> • Applied the thematic alignment of themes in order to categorise similar themes as well as identifying relationships between them. 	The researcher finalised the following: <ul style="list-style-type: none"> • Microsoft Excel spreadsheet that contains themes and relationships between themes
<i>Phase 4: reviewing themes</i>	The researcher had: <ul style="list-style-type: none"> • Developed a thematic map as a framework for the development of the report. 	The researcher finalised the following: <ul style="list-style-type: none"> • Microsoft Excel spreadsheet that contains a thematic map in addition to the previously mentioned artefacts
<i>Phase 5: defining and naming themes</i>	The researcher had: <ul style="list-style-type: none"> • The researcher refined the thematic map and finalised the each theme based on the groupings of data that existed and ensured accuracy of the composition of the themes. 	The researcher finalised the following: <ul style="list-style-type: none"> • Microsoft Excel spreadsheet that thematic map in addition to the previously mentioned artefacts
<i>Phase 6: producing the report</i>	The researcher had: <ul style="list-style-type: none"> • The researcher will construct the final data analysis and findings section of this research paper by producing a report that concisely encompasses all the data collected. 	The researcher finalised the following: <ul style="list-style-type: none"> • The completed empirical study that provides a comprehensive account of the findings in a Microsoft Word format

Table 6 : Application of thematic analysis process by the researcher.

Due to the sample size and expected data collection quantity, the research will be completed manually via the abovementioned thematic analysis process. The primary themes relevant to this study are the four component of the organisational performance, namely profitability, productivity, cost reduction and intangible benefits. Each of these primary themes will be substantiated by the sub-themes derived by the thematic analysis process with the thematic map forming the structure of report.

Reliability and Validity

LeCompte & Goetz (1982) iterated in their research that qualitative research does not adhere to or provides the appropriate level of reliability and validity rigour that is more inherent in quantitative research. Considering that the data collection approach of this research paper is qualitative, the researcher will align to the views of LeCompte & Goetz (1982) and ensure that reliability and validity is maintained as follows:

- ***Reliability***

Reliability involves the avoidance of replication of 'scientific findings' (LeCompte & Goetz, 1982). Reliability in qualitative research is impacted by problems that have both internal and external origin that requires resolution (Hansen, 1979). External reliability focusses on whether researchers would unearth or generate similar phenomena to that which has been discovered in prior research. Internal reliability relates to how much of the data collected and interpreted for a similar or the same constructs matches that of the original researcher.

The researcher ensured that all the necessary activities will be carried out during the data analysis process to ensure that the data is not replicated in any form. The researcher reviewed the full set of transcripts for errors, produced a thematic map and documented the report while ensuring that triangulation is conducted against the literature review as well as the research objectives. This three way reconciliation process allowed the researcher to continuously warrant that a high level of both internal and external reliability was being maintained.

However, as mentioned in the research limitations, due to the time constraints impacting this research project, the transcripts were not returned to the participants for review and hence this shortcoming may have an impact on the reliability of the data as well.

- ***Validity***

Validity within academic research focusses on the accuracy of 'scientific findings' (LeCompte & Goetz, 1982). Validity further attempts to unearth the extent to which the 'scientific findings' and conclusions aligns itself to the observable reality while ensuring that constructs developed are accurately stated.

Whittemore, Chase & Mandle (2001) have identified four primary criteria for validity when embarking upon a qualitative research approach. The four criteria are credibility, authenticity, criticality and integrity. In order to ensure that validity is maintained and aligned to the criteria outlined above, the researcher provides the assurance that the following was carried out:

- The researcher maintained their neutrality throughout the process,
- The researcher ensured that a rigorous interview, data collection and data transformation was undertaken, and
- The researcher confirmed that triangulation as an imperative and conducted throughout the duration of the project.

In summary, the researcher undertook the necessary measures to ensure that this research project would maintain a high level of reliability and validity.

3.9. Ethics, Privacy and Confidentiality

The institution examining this research paper have stipulated a rigorous procedure that must be adhered to in order to protect the rights and privacy of all participant in the data collection process.

3.9.1. Approval

The researcher completed the university's ethics approval questionnaire with full disclosure of the nature of the study, the target audience and impact assessment on participants (see appendix D). The researcher also furnished the ethics committee with the organisational approval for research to be conducted (see appendix C), the interview questions and protocol as well as the formal individual participant interview consent forms (see appendix A and B).

The ethics committee reviewed and assessed the motivations and artefacts presented and confirmed approval for the data collection process to proceed.

3.9.2. Privacy

Privacy is considered as an individual's right to exercise control over their personal information by providing consent for the use thereof, including disclosure. For the purposes of this study, the individual interviewees will provide written consent for voluntarily revealing or expressing their personal insights to the detailed and strategic viewpoints of the organisation being studied, with the condition of being afforded full anonymity. In addition, the organisational approval was granted on the basis that the organisation will not be disclosed and that they have the rights to the documentation over and above the individual conditions specified.

Therefore, the data collection process will comply with the conditions set out and agreed upon above.

3.9.3. Confidentiality

Confidentiality relates to the treatment of the information that was collected based on the conditions of privacy set out above and the expectation that these conditions will be adhered to. In terms of maintaining confidentiality within the data collection and application within the study, all data will be collected under conditions of anonymity with any identifiers being removed, if necessary, within the transcription process itself.

The access to research data will only be provided on a 'minimum necessary' standard basis, if deemed a requirement and requested by an authorised official within the university faculty. Confidentiality will be maintained throughout the data collection and research process as per the conditions set out above.

3.9.4. Security

As a result of the researcher being sponsored by his employers, the researcher has been granted full use of the employers technical environment and therefore will be provided with the technical safeguards that includes the use of computer password protection, firewall security, anti-virus software, both PC and network server encryption as well as other forms of data protection from unauthorized access, loss or modification.

In addition to this, and for the purpose of protection of the research data, all documents pertaining to transcripts and thematic analysis, namely Microsoft Word documents and Excel spreadsheets, will be password protected and stored for a maximum of 24 months before

being destroyed. The transcription will be carried out by the researcher and as a result third party breaches will be mitigated. Data security will be managed within the conditions stipulated above.

In conclusion, the researcher has and will ensure that all participants whether organisation or individual have their rights and privacy respected and protected by following due process as stipulated by the university with regard to privacy, confidentiality and security.

3.10. Summary

The primary objective of this research project is to understand how the investment in self-service technologies affects organisational performance within the South African financial services context. This section provided the motivation and justification of the research design, methodology and data collection approach that the researcher elected to ensue in order to provide a structured outcome for addressing the research questions.

The researcher adopted a modern post-positivistic philosophy that was explanatory in purpose while following a deductive research approach with a case study strategy that was cross sectional from a time frame perspective.

4. Data Analysis and Findings

The primary objective of this research was to understand the impact of investment in SST on organisational performance in the South African financial services industry. This objective is supported by two distinct research sub questions that tests the strategic intent of an organisation to invest in SST as well as the relational impacts on the organisational performance.

The data analysis as set out in section 3.8.5 will follow a similar theme; however the findings have presented itself as three significant constructs, namely the strategic intent for investments in SST, the impact of SST on organisational performance and the relational dynamics between the two mentioned constructs.

The following section will focus on the strategic intent of the organisation to invest in SST and is depicted by the white circle of figure 8 (below) that outlines the scope of the analysis and findings.

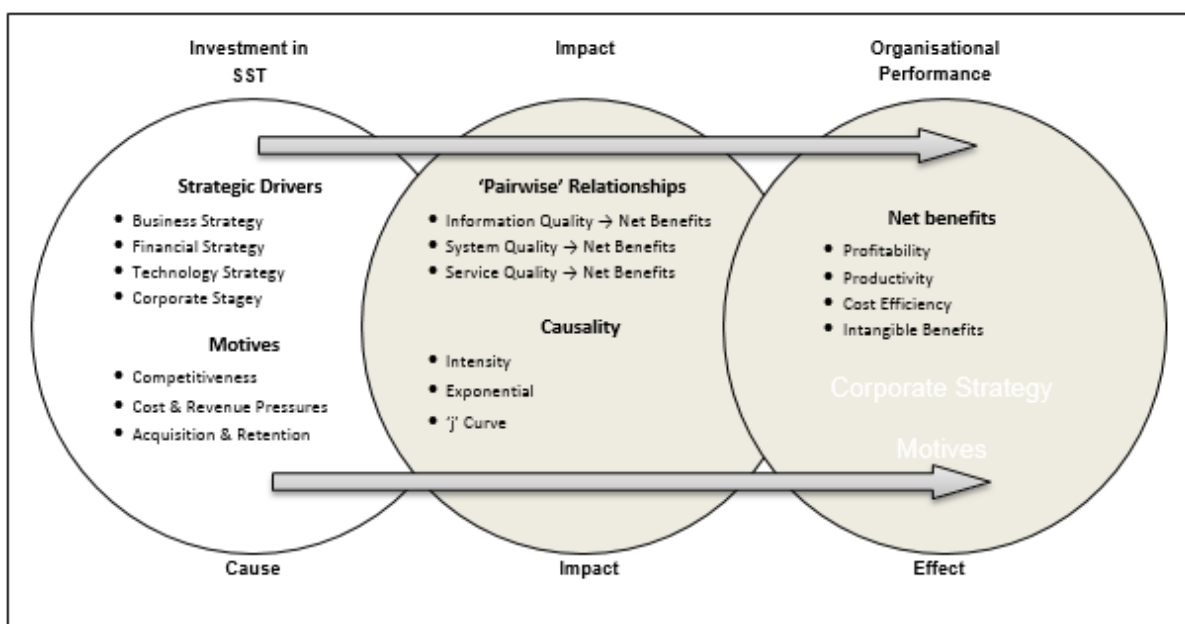


Figure 8: The scope of the strategic intent of the organisation to invest in SST

4.1. Investment in SST

As mentioned earlier in this paper, DeLone and McLean (2003) iterated that it is important to understand the management behavioural aspects as well as the quantum of investment in systems when attempting to measure success of that system. Therefore from a system investment perspective, it would be prudent to understand what drives investment decision

making by management within an organisation. These decisions may be categorised into two aspects, namely strategic intent and motives.

This section will examine the underlying reasoning for the decision making process that allows organisation to invest in information systems.

In addition, for the purpose of this study, the investment perspective has been extended beyond that of the general system or information systems environment to include the SST environment as well.

4.1.1. Strategic Drivers

Petter et al. (2008, p. 236) quoted that “Naturally, organizations are interested in knowing the return on these investments. The impacts of IT are often indirect and influenced by human, organizational, and environmental factors therefore, measurement of information systems (IS) success is both complex and illusive.” This statement highlights the fact that organisations consider influencing environmental factors when making investment decisions to acquire an information system or for the enhancement of one.

These influential factors are prevalent in most environments and no different in the organisation that formed the unit of analysis for this study. This section of the study carefully examines the strategic reasoning or intent offered by organisations to invest in SST. The research identified four thematic strategic drivers, namely business or operational, financial, technological and organisational or corporate strategies that influenced the organisation’s decision making reasoning to investment in SST.

4.1.1.1. Business/Operational strategy

Business or operational strategy for the purpose of this study is considered to be a functional strategy in order to improve processes and efficiencies within the organisation. An example of improvement in an operational strategy would be the increase in productivity due to the implementation of software or the like that culminates in the increase or additional capacity.

Shift in global trends

It was recognised in the literature review that, from a banking perspective, the global trends in the financial services industry has commenced its shift towards SST. The research process further confirmed this phenomenon and narrowing the present day focus to the digital aspects of SST. These views were supported by Mols (1998) who was earlier referenced for predicting that the SST or digital channels would form an alternative or

'supplementary' channel to that of the branch network channel, while there was no conclusive standpoint that SSTs would replace the branch network.

The respondents agreed with the assertion that there was a clear shift in the banking industry servicing landscape and that the SST channel was the catalyst for this shift. Therefore the confirmation of the global trend would be a shift toward digital banking and was agreed with by five respondents. One respondent concurred with the notion of a shift in trends by highlighting that:

Recently we looked at the global trends around where banking is going and there is going to be a lot of shift into self-servicing for clients. Secondly, we looked at the penetration of technology around self-service and we see a technological trend towards mobile banking, digital banking.

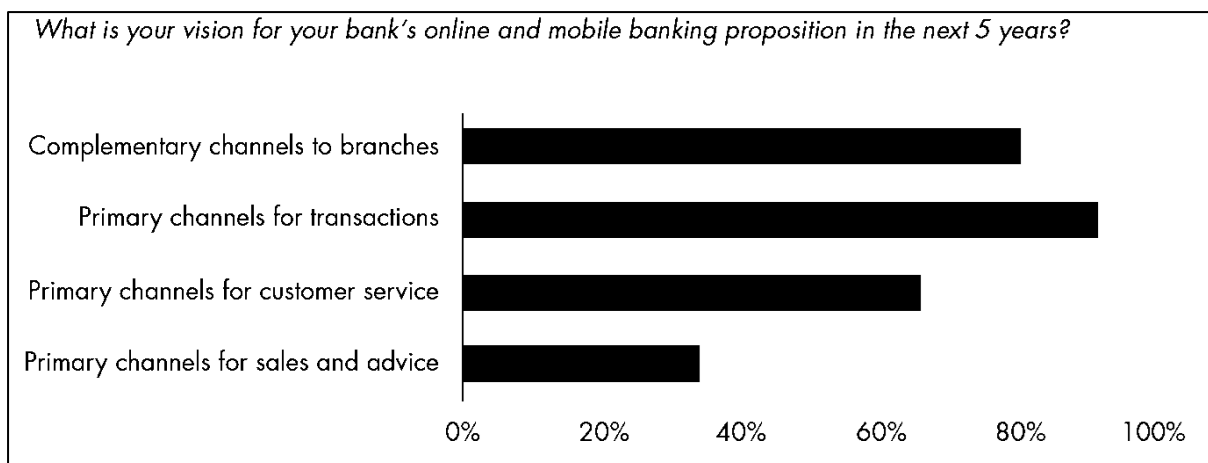


Figure 9: The Global Retail Banking Digital Marketing Report (2013)

The primary facilities within the digital banking offering are considered to be internet banking or e-commerce as well as mobile banking or m-commerce. Although mobile banking is considered to be in its infancy phase in terms of the product lifecycle, it is believed, by all respondents, to be the primary facility for the future due to the expected capability of mobile phone.

This view was concurred with by Curran & Meuter (2005) and Zuccaro & Savard (2010) who considered m-commerce in North America in its infancy in terms of the product life cycle as adoption was slow due to attitudinal and infrastructural shortcomings that required improvement. Even though these views may exist within this research realm, all viewpoints further iterated that the future of m-commerce is anticipatory.

The research information included in The Global Retail Banking Digital Marketing report (2013) furnished in Figure 9, corroborates this study's viewpoint that the m-commerce is becoming the primary channel for the future based on the feedback of the majority of participants. It is evident from the information provided in figure 9 that the mobile facility will become the primary channel for transactions and client servicing in the future.

Convenience factor

Further to the global trends, organisations have identified the convenience factor of SSTs to be a compelling element that would influence the operational or business strategy. Convenience was highlighted as a key factor in the success of SST as it ensured 'anywhere and anytime' banking or investment. All the respondents highlighted that this attribute is becoming the norm from a servicing perspective and operationally allows the organisation to maintain its connection with the client or investor. Organisationally, it was therefore concluded that investment in SST would improve the convenience aspect of operational or business improvement and therefore contribute to acquisition and retention of clients and supported by findings reflected in figure 5 above.

Shift from physical channels

The primary operational or business strategic driver that was highlighted by the majority of respondents in the research was the planned and anticipated shift from the physical channel, namely the branch network to that of the SST channel. This shift is considered a strategic operational imperative as it offers the logical progression into the modern era of financial services. The reduction of reliance on the physical channel is imminent for many reasons including improved servicing throughput and turnarounds, increased capacity and extended client fulfilment.

The expected factors influencing the operational or business strategies of an organisation such as the shift in global banking trends, the convenience factor and the movement from physical channels would provide input into the SST investment strategy. These factors are impacted by the presence or continued improvement of SST facilities.

4.1.1.2. Financial

Investment strategies, and in particular a SST investment strategy, are more often significantly influenced by the financial levers and in many cases the sole consideration for investment decision making, especially for those organisations with shareholder responsibility. Gensler et al. (2012, p.193) highlighted that "understanding the revenue and cost-to-serve effects of online use suggests which strategy to pursue to ensure effective

customer relationships” and iterates that there is a need for financial input into a SST investments strategy, however, it should not be considered in isolation during the decision making process. These findings raised the following factors influencing the financial elements of a SST strategy.

Balance of needs versus client focus strategy

The investment strategy decision making process provided conflicting views from the respondents. Two approaches were highlighted in the SST investment strategy formulation process, namely the targeted investment approach based on the balance of needs of the day versus the targeted client focus strategy.

Two respondents highlighted that the balance of needs of the day strategy focussed on the delivery of a singular or individual facility that delivers benefits in isolation. For example, one respondent highlighted that a business case process would be followed culminating with the implementation of system for a particular purpose, market segment or client type. This approach does generate benefits; however, may not be considered effective when implementing a SST strategy that comprises of many different facilities and in particular those defined in this study. The result may be an inconsistent cost structures for clients through disparate decision making via isolated processes.

A targeted client focussed approach, canvassed by a further five respondents while another made mention of it, was described as a holistic strategic focus on the client’s needs and how to fulfil them. This approach does not solely focus on the digital channel or the physical channel but concentrates on understanding what is required to provide the best and most viable proposition to the client. This strategy may not be considered a technology strategy. Therefore the strategy will change over time as the landscape changes. However, considering the current landscape, the focus has shifted to investing in SSTs in order to supplement the physical channel with an expected turnaround in focus in the medium to long term.

Considering the approaches highlighted, the client focussed strategy provides the more rigorous and holistic method of adoption by any organisation when investment decision making is required. The expected quantifiable benefits will be considered universally through the organisation as opposed to a focus or isolated benefit.

This aspect of a financial strategic driver for SST investment decision making purposes was considered as a key factor by most of the respondents.

Cost reduction

Ou et al., (2009) in their study of the impact of SST, in particular ATM's, confirmed that analysing the effect that information systems has on cost efficiency will allow for improved decision making within the organisation when it is approached with system investment decisions. This statement supports the findings of this research for the fact that cost reduction plays a fundamental role in the influencing of most strategies and for the purposes of the study the investment strategy of SSTs.

The majority of the respondents agreed that the driving factor supporting the cost reduction in the SST strategy would be the expected reduction in the cost to serve, via the re-use factor that the present day technological architecture provides. As confirmation of the reduction in cost to serve one respondent provide the following rationale:

Our clients want convenience at a price. Meaning that in order for us not to do SST would be very costly for the business which would mean we would have to charge that client for that service, and the only way one can actually achieve this if we have to invest in technology so that we don't have to pass on the costly expenses and costly infrastructure onto the client.

Therefore the classical business case motivation should be assumed in a scenario where the cost reduction is achieved through an investment in SST facilities with the revenue model unchanged or improved as a result of adoption of the facilities. The results of this scenario may well be received positively within the organisation as it will strengthen its financial model by virtue of a conclusive SST investment strategy.

Investment in SST is currently being considered based on the cost reduction factor, from a financial perspective, via two dimensions, namely the impact of not investing in SST or the strategic benefits of investing appropriately in SST facilities.

These two dimensions counteract or oppose each other as there is a cost of not making an investment in SST which would exacerbate the views of the respondent quoted above by adversely increasing the cost to serve as the client base grows. This cost growth will impact the unit service costs and ultimately reduce the profit margins. In contrast, an investment decision in an SST platform would reduce the unit cost to serve as these platforms are volume based facilities that do not require high cost resources to operate and serve. Low unit costs to serve supports margin strength or growth and provides the necessary competitive base to ensure that the organisation remains strong and relative.

The financial imperatives outlined in this section clearly emphasize the need for strategic financial drivers when making invest decisions around SST strategies. The key factor to consider is that financial drivers must not be considered in isolation or the solitary reason for investing in SSTs although it may be easier to follow that path as it may only be satisfying the organisation's short term financial benefits.

4.1.1.3. Technological

The technological impact on investment decisions made from an investment in SST perspective is paramount. However, they also supplement other strategic drivers in the overall strategic decision making process.

Technology has had an impact on the banking and investment industry from both an evolutionary and an adoption perspective. Kuisma et al. (2007) and Green & Van Belle (2003) iterated that technology advancement had not kept pace with the evolutionary needs of clients and therefore there were reservations about whether organisations wanted to advance their offerings. The advancement of technology would allow for ease of use by clients and therefore support the improvement of adoption rates.

The quality of the local and national technological infrastructure would influence the decisions around investment into a strategy that requires the necessary performance to improve the client experience (Wonglimpiyarat, 2014; Al-Somali, Gholami & Clegg, 2009). It would be counterproductive to invest in a technological solution that operates on a weak external backbone offering substandard performance. These factors contribute to decision making that focus on technology. However, organisations have a few key themes that would require addressing when deciding inwardly on an SST investment decision. Maduku (2014) considered the South African SST landscape mature and functional, and therefore the assumption would arise that the quality of local and national infrastructure would no longer be a technological inhibitor.

Considering the South African landscape, the key strategic technological themes that surfaced during the research findings in terms of the impact on SST investment strategy were the advent of smartphone technology, the adaptability of SST facilities and the centralisation of back-end platforms to offer multiple access points. It is evident that management within the organisation opted for an inward retrospective view when making technological decisions.

Smartphones

The advent of the smartphone was brought into perspective via a quote published as “Customer attitudes towards mobile banking have become positive due to the emergence of advanced mobile and smartphone technology, advancements in functionalities and security features, and an overall increase in the use of smartphones by the banking public” (WITS Business School, 2012, p.14). This statement corroborates the perspectives highlighted in the findings below.

The smartphone has introduced many features that allow consumers to connect and remain connected with the organisation in an easy manner. These features are made possible via the significantly improved processing power as well as the ease of navigation primarily via touch screens. In addition, these devices allow for interoperability via purpose built applications on almost all operating platforms allowing user or segment specific targeting.

Half the respondents considered the South African demographic and its ‘duality’ from a technology averse and adoptive perspective. Shambare (2011) also considers the ‘duality’ aspect when he highlights that the adoption of mobile phone banking may not be at acceptable levels as yet, however, organisations should consider it as an essential component of its SST strategy. This viewpoint respects the fact that there is a ‘mass’ market that requires penetration in the form of a mobile offering within the South African context. This would allow organisations to provide an appropriate set of products via a channel that will allow instantaneous interaction whether feature or smartphone enabled.

The majority of users or clients are currently entrenched in feature phone usage due to affordability of smartphone remaining a factor. The feature phone banking options remain the primary mobile device for service offering via the Unstructured Supplementary Service Data (USSD) or SMS banking. The views expressed by these respondents highlighted that the smartphone adoption rate will increase as feature phones are phased out as a device type while the economies and improvement in the technology of smartphones will allow them to become more affordable to the wider user network in South Africa.

It will therefore be imperative to take the smartphone and its capabilities into account when making strategic decision centred on investment in SST while also considering the South Africa market context.

Adaptability of SST facilities

Ou et al. (2009, p.442) verified that the ATM was underutilised in most economies by claiming that “Currently, their main functions include cash deposit and withdrawals, transfer,

cash advance, bill payment, and account balance checking: somewhat less than those offered in the U.S. and Japan”. Considering the effectiveness and the adaptability of the technology that is being deployed from an ATM perspective, the research highlighted that there is an opportunity similar to those in first world economies to offer more services than what is the currently offered.

These facilities have the capabilities to provide larger product distribution services including non-banking product distribution. All the five respondents that had a retail banking responsibility raised the fact that these initiatives will contribute to the improvement of the revenue model considering that ATM facilities are deemed to be the more costly facility of the SST offering. The ATM is one example of the adaptability of this channel that will assist management with their strategic decision making when formulating their SST investment strategy.

Centralised back-end platforms to offer multiple access points

In the literature review Michaels (2007) highlighted that technology has been evolving and improving significantly over the past few decades while there has been a continuous investment as a result. Although SST facilities have not been around for as long as the improvement in technology has been experienced, it has participated in this improvement.

As a result of this evolution, SST infrastructures have evolved from silo designs to a more interoperable and ubiquitous design set. This new infrastructure design sets allows for centralised operational platforms to provide access to a variety of front-end or thin client facilities. All three technology based respondents highlighted that these thin client facilities each target a specific service offering for fulfilling client needs, namely e-commerce and m-commerce facilities.

Dohmen, Moormann, & Rosemann (2009) in their research centred on the use of smartphone in customer centric banking highlighted the importance of a centralised infrastructure that allows for integration of various services with a bundled back-end service. Figure 10 provides a schematic diagram of a typical integration architecture that will support a smartphone SST facility.

The architecture in Figure 10 typically resembles a tiered architecture that relies on an integrated set of technologies that relays data from end to end based on a set of queries invoked by the end user. The architecture consists of a back-end or product system that is the custodian of the client’s financial record, the middleware layer that receives and

transforms instructions that it receives from the front-end layer. The front end layer represents the various channel integration systems.

For the purpose of this research exercise, the SST channels are depicted as ATM, internet banking and mobile banking, will be integrated to the middleware layer to pass financial transaction instructions to product system.

This type of architecture contributes to efficiencies as it allows for a one-to-many system relationship that is front-end agnostic. In addition this architecture will assist in the SST investment decision making process as it will not be construed as the development and integration of purpose built facilities but rather an infrastructure that is flexible and scalable depending on the needs of the client.

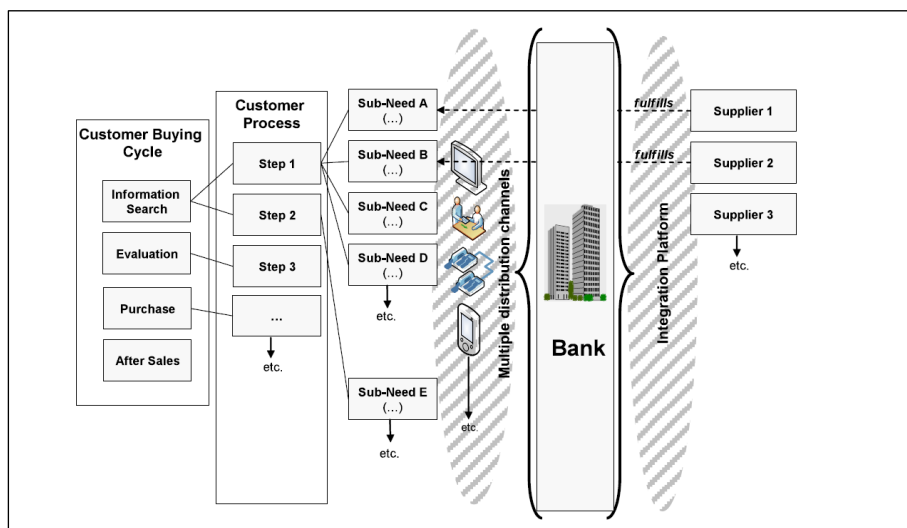


Figure 10: Draft of a customer-process-centric business model for retail banking

Source: Dohmen et al. (2009)

4.1.1.4. Organisational or Corporate

“Corporate or organisational strategy defines the business in which the company will compete, preferably in a way that focuses resources to convert distinctive competence into competitive advantage” as defined by Andrews (1997, p.52). The definition furnished articulate the level at which decisions are made within the organisation with the aim of transforming areas of potential opportunity into benefits as a result of a competitive advantage. The advent and rise of SST usage aligns itself with this definition as corporate decisions were made to initially implement this technology followed by the enhancement and redefinition of its function.

Management at executive and senior levels considering a SST investment strategy will consider the role SST plays in the creation of business value, as being a strategic lever, when coercing the reduction of resource capacity and the like. The respondents agreed that the SST channel is a 'relative' new component of the business strategy, however, it was imperative that it was considered as result of future expectations and benefits.

SST is becoming key strategic lever

Financial services businesses are considering SSTs as strategic component of their overall corporate strategy for many reasons. The primary reason for this would be that there is a possibility to create value through reducing capacity as well as extending the product offering from an access perspective. The benefits are not necessarily considered from a technological perspective, but how the client may be accommodated to meet their required needs.

Therefore creating value through cost savings, possible client acquisition and retention would contribute to stakeholder value and in particular shareholder return. The findings iterated the views expressed by the respondents that the achieved and/or expected value creation through SSTs would therefore incentivise most organisations when considering an SST investment strategy.

Creating business value through IT advancement

There are two possible technological strategies that could be adhered to when delivering systems, namely a 'big bang' approach or a 'stepped' change approach of incremental releases. From a corporate perspective the strategy to be employed is very important and considered of greater importance when contemplating a SST investment strategy. SST, as mentioned in the literature review, has evolved from a simple conceptual facility such as an ATM into more pervasive facilities which requires continual assessments of its contribution and position within an organisation.

A 'big bang' strategy or approach may be described as the instantaneous deployment of system that includes all the functionality that is perceived to make the user operational. This strategy may be all encompassing and, in most instances, costly while maintaining the continual evolution of that system may also be burdensome due to the fact that catering for future evolution is less of a priority at the point of implementation. This strategy caters primarily for the needs of the day and provides short term value for the organisation due to possible inflexibility. This approach was not favoured by most of the respondents as there was a greater affinity expressed with the 'stepped' change approach for the reasons below.

In contrast, the business value that may be created from incremental or 'stepped change' strategies are considered more beneficial as the offering will be designed for changes based on the evolution of both the business and technology. The change will be realised based on the continuous changing of needs by clients and the costs will be small in relation to other system costs. The fundamental aspect of this strategy is to build the required platform with enough integration opportunities. Once the infrastructure was delivered, management would be in a position to make the necessary strategic decisions for an investment strategy in SST including an integrated corporate focus that will provide continuous value.

Once the strategic reasoning for decision making centred around the investment strategy in SST could be understood, the next steps would be to understand the compelling motives as to why organisations need an investment strategy in SST. These motives are examined in the following section.

4.1.2. Motives

There are various motives as to why it would be important to develop or consider an SST investment strategy. To provide context, motives may be considered as any action that is taken as a result of a desired need that is usually out of the organisation's control and predominantly driven from the external environment. The research highlighted a few motives that will be examined in the following sections.

4.1.2.1. Competitiveness

Kettinger, Grover, Guha, and Segar (1994, p.31) quoted that:

Sustainability of competitive advantage may be achieved by leveraging unique firm attributes with information technology to realize long-term performance gains. Information systems that cannot sustain competitive impact have only transient strategic value or may offer negative value if matched by a superior response by competitors.

The argument raised by Kettinger et al. (1994) has significant consequences for organisations who do not consider SST to be a strategic imperative.

SSTs must be considered a strategic driver and offered to clients' initially as basic service and gradually converted into a competitive advantage based on the growing understanding of their needs. There is a very strong view that ignoring SST as an offering and more importantly being devoid of a strategy to deploy this technology would be detrimental to the organisation. It is considered a 'ticket to the game' by most of the research feedback.

The consequence of ignoring a SST strategy would be the inability to offer clients convenience, self-service and the like. Clients have evolved in the same manner that technology has and have become more expectant and sophisticated while becoming more aware of their environment in terms of what is being offered by the various institutions. Six of the respondents provided clarity by further highlighting that this means that clients are not prepared to accept a service lacking a comprehensive supplementary SST offering.

Furthermore, two respondents stressed that the industry has also become sophisticated and will seize on any opportunity to raise their net client acquisition numbers, and have implemented 'easy-to-switch' facilities to on-board any disillusioned or unhappy client efficiently. This type of competitive environment will pose challenges to any organisation that are not focussed on meeting their clients' needs holistically.

It is evident from the views expressed above that the competitive risk of ignoring an SST strategy has more negative impact on an organisation in the financial services industry, and must be considered a motivating factor in terms maintaining competitiveness.

4.1.2.2. Client acquisition and retention

The next organisational motive for requiring a SST investments strategy examines the client's interaction with an organisation. This interaction is particularly necessary for that organisation to acquire and retain that client via the direct and indirect deployment of a SST facility. In support of this finding, Yen and Gwinner (2003, p.483) understood the client relationship with an organisation to be as follows: "A customer's decision for entering into and maintaining a long-term relationship with a company is largely driven by their assessment of the core product/service and the relational aspects of the exchange".

Dabholkar (1996) and Meuter et al. (2000) supported this view from an attitudinal perspective in the literature review by highlighting that a positive experience would allow confidence in the adoption and continual use of the SST facilities.

The findings of this research supplements the views expressed in the literature above by confirming that from an acquisition perspective SST provides a greater reach for the organisation as the internet and telecommunications environment is boundary-less and access is unlimited and unrestrictive. The technology based respondents emphasised that the organisation may use this environment to acquire clients via a 'push' strategy rather than a 'pull' strategy. The 'push' strategy allows the organisation to enlighten the client, first as to what is available via this channel, and secondly, offer the most appropriate facility to interact with as part of a client focussed strategy. All business plans involve attracting more clients as

it grows revenue. The deployment of SST definitely supports this and in certain cases, namely m-commerce clients may be acquired without personal interaction or even prior on-boarding which presents a strong business case in itself.

Acquiring a client may be a source of new revenue; however existing client retention may prove challenging as well. Five of the respondents raised the fact that retention strategies are highly dependent on relational and attitudinal expectations of trust and loyalty by both parties, namely the client and the organisation. One respondent stated that the organisation, more importantly, has to portray the trust relationship by offering an SST facility that is primarily accurate and reliable and clients will reciprocate with their loyalty.

Retention and acquisition from a SST perspective is a fundamental motivational reason for any organisation to have a strategy that will allow it to prosper and create future sustainability. The absence of an SST investment strategy would prove to be catastrophic in an industry where client demands and expectations are rising daily and having to be met by organisations.

4.1.2.3. Cost and revenue pressures

Tedeschi (2005) made reference to the fact that the Bank of America mentioned that their 12.6 million SST clients were at least 27% more profitable to that organisation than those being serviced manually. This is a fact that was raised in 2005 where there was limited use of SST with the ATM being the primary facility. The landscape has changed with particular emphasis on revenue and cost pressures as a result of the adoption rate of SST and the competitive environment that has established itself.

In order for the organisation to be successful it has to reduce its cost to serve the client via innovative ways. The research findings, based on the majority of the respondents feedback, confers that the most apparent innovative channel strategy over the past few years, besides actual product advancements, is the SST channel strategy. The SST channel will improve margins as its infrastructure is based on the usage of technology for client interaction in its entirety which means that it eliminates the largest cost generator of any organisation, namely human labour costs. This technology would allow for costs to be reduced and therefore allow margins to be maintained and maybe increased. This margin impact will allow the organisation to absorb price pressures and remain profitable as the cost to serve will be less as a result of SST deployment. The motivation for any organisation's sustainability from a financial perspective is paramount and must be of great consideration by management.

Gensler et al. (2012) further highlighted in corroboration with the views expressed above that the utilisation by clients of SST facilities on a repetitive basis would generate 50% more revenue for the organisation than if that organisation were to service that client via a channel other than the SST. This is an illustration of how the cost to serve and ease of use aspects of SSTs could be used to drive up revenue. This view was supported by all the respondents.

In conclusion, most organisations must consider an SST investments strategy as an important ingredient in their strategy as the findings suggest that there may be significant consequences if it is ignored or considered as a non-essential channel. This view has been concurred with in the literature review by Hsieh (2005).

This section examined the reasoning behind the need for including a SST investment strategy into the organisation's strategy as well as the compelling motives to limit the impact of not having an SST investments strategy on the organisation's sustainability. The next section will examine the impact on the organisational performance construct as a result of SST deployment.

4.2. Impact on Organisational Performance

The literature review provided an inconclusive examination regarding whether the deployment of information systems have an impact organisational performance or not. It must be further highlighted that this lack of research pertains to information systems and is widened by the fact that there is even less research when considering the SST landscape.

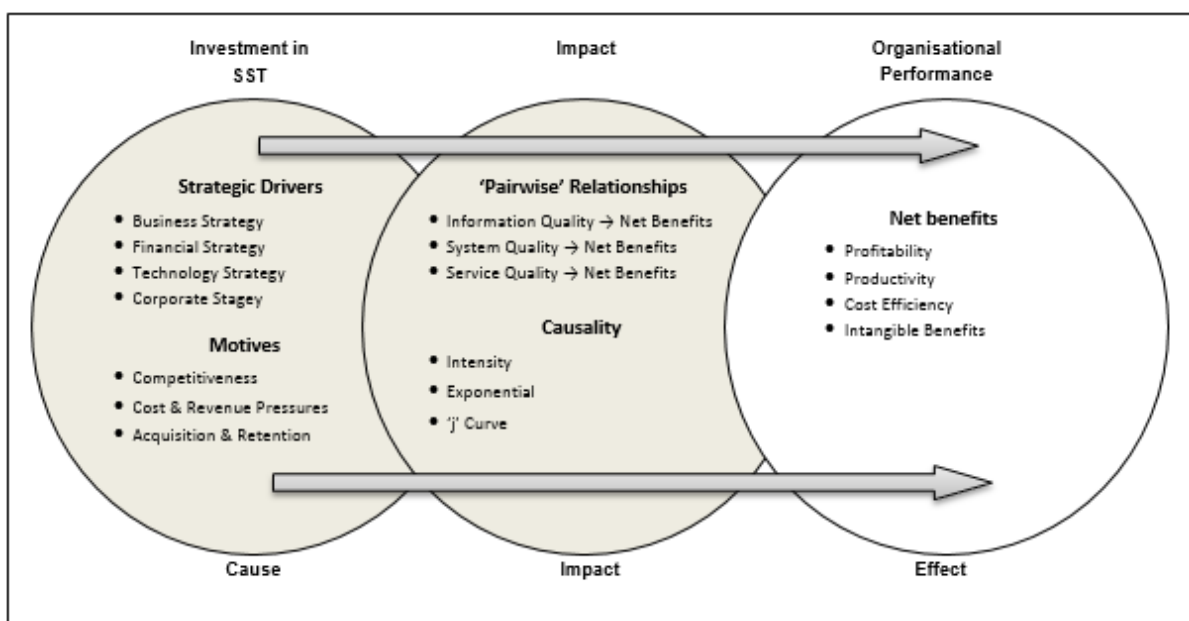


Figure 11: Impact on Organisational Performance

A component of the overall research focussed specifically on this aspect and examines the impact of investment in SST on the four specific elements of organisational performance, namely profitability, productivity, cost efficiency and intangible benefits. The scope of the findings that are attributed to this construct is contextualised in Figure 11 above and depicted within the white circle on the far right.

4.2.1. Profitability

Dedrick (2003) initially confirmed that there was lack of evidence to suggest that there was a clear link between investment in information systems and profitability. According to recent research, Gensler et al. (2012, p.192) has iterated that “An empirical study of retail banking customers reveals that online use improves customer profitability by increasing customer revenue and decreasing cost to serve”.

Blankey (2006) confirmed, that within the Australian context, organisations across most sectors were 5½ time more likely to be profitable due to the introduction of innovative technology. It is evident that research over time has rendered more conclusive postulation that there is a link between SST and profitability.

In addition to the above-mentioned postulation, the research finding corroborates this fact by examining the various factors associated with the impact on profitability.

4.2.1.1. Expected future revenue streams via SST

A respondent underlined that in the early 2000's up to 80% of revenues were generated via the physical branch network primarily from a non-interest revenue point of view. The industry has also experienced a turnaround since then with the physical branch network only accounting for approximately 20% of the revenue at present. This remarkable turnaround has been through the deployment of electronic channels and in particular SST channels. The contribution of SST in the generation of revenue has been significant in its various forms.

In their annual operational report, Standard Bank South Africa projected an aggressive mobile phone adoption target, over four years to 2015. The bank intended to increase their user base eight-fold (as depicted in Figure 12 below) as a result of the benefits of shifting clients or users to the SST channels (Sustainability Report, 2011). This deliberate strategy to grow the number of users means that the organisation would expect to increase revenue as a result of transaction volumes as well as reduce costs. This action deduces the there is an expectation of increased profits via their SST channel.

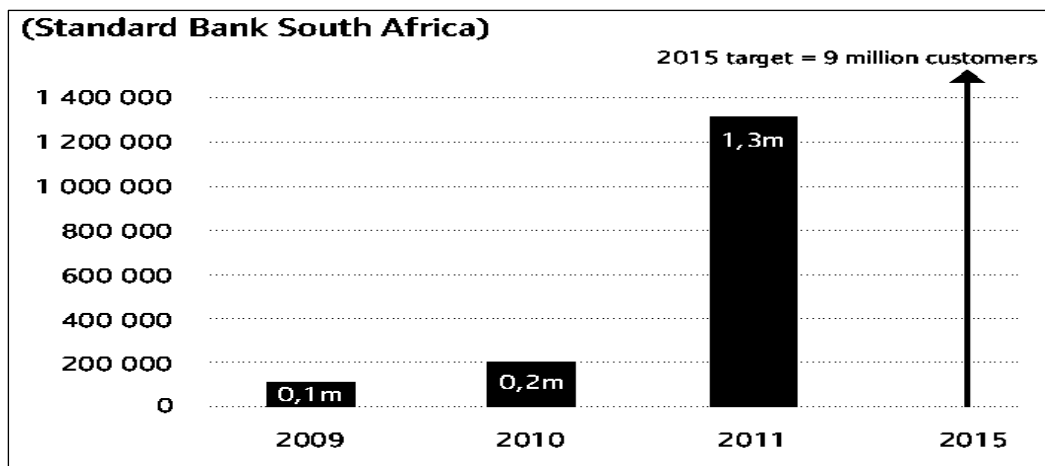


Figure 12: Cellphone banking customers

Source: Sustainability Report (2011)

A respondent provided a further example of revenue generation in the form of the phenomenal shift in reliance on SST channels in the corporate banking business stream. The business-to-business (B2B) SST facilities have been instilled as the primary or possibly only transactional facility for corporate clients. These B2B facilities tend to lock in clients while allowing them to generate as many transactions as they required in order to facilitate the running of their businesses. The processing of transaction generates revenue for the organisation as well.

Pujari (2004) concurs with these views expressed by highlighting that B2B clients receives benefit differently from SST channels than end clients would. The primary expectations by B2B clients of an SST channel are the intensity of the speed and improved efficiency. This equates to higher throughput of transactions as well as improved turnarounds for those beneficiary businesses.

From the perspective of a retail client, the SST infrastructure is factually cheaper to use as opposed to the physical channels due to the systematic interactions on a platform that requires little human intervention and is designed for scale. As a result of this reduction of costs, clients are inclined to increase their usage and in so doing contribute to the increase in revenues. This ultimately causes a shift from the more costly physical channel interaction allowing the clients to transact at their convenience while increasing the rate of transacting. This increase in transaction rate culminates in an increase of revenue for the organisation.

The findings have conclusively confirmed that the advent of SST has impacted revenues positively and that it will continue to do so in the future.

4.2.1.2. SST channels are cheaper

The investment in SST platforms is imperative, as highlighted earlier in this study. Prudent infrastructure design would provide for a centralised product platform that integrates easily to various interactive SSTs. Once this infrastructure is designed, then client interaction with the system would cost the equivalent of running the infrastructure. Therefore additional volume of transactions would reduce the unit cost of that transaction. This view was expressed and confirmed by five of the respondents.

Understanding the costs associated with the various SST channels, the ATM was considered the most expensive as a result of its manual maintenance. However it was still considered a profitable channel. This viewpoint was supported by a respondent who confirmed that “the more ATMs we have put out for the last couple of years, even last year we have seen an increase in transactions and an increase in profitability”.

The e-commerce and m-commerce channels were confirmed by all respondents as the cheapest channels to offer to clients as there was limited human intervention as opposed to ATM that would require manning in the form of cash or statement generation inventory replenishment. The digital and mobile channels only required an active connection and a maintenance team to ensure backend system uptime to offer 24 hour per day availability for 365 days.

Apart from the servicing benefits, the deployment of SST channels has definite cost benefits by virtue of its nature. The business case for SST investment and deployment will in most instances be acceptable primarily based on the cost being reduced as volume increases due to the platform scalability. This channel will also be attractive to the end client or end user if they also participate in a low cost environment and hence contribute to a favourable adoption and retention rate which in turn impacts organisational performance.

4.2.1.3. Cycle dependent

The reduction of costs as a result of the deployment of SST is always considered a motivating factor for making decisions regarding the investment strategy in SST. The research findings iterated that most of the SST facilities that are expected to provide relatively good returns are in their infancy or growth phase of the product life cycle, namely e-commerce and m-commerce. One respondent highlighted an example of this by emphasizing that m-commerce has only been established as viable a SST facilities since around 2011 and is considered to be in its infancy from a life cycle perspective.

These SST facilities are therefore in the process of being refined and improved upon and have not realised their potential organisational benefit or expected returns. This refinement costs the organisation from a capital perspective and therefore produces loss situations for the first year or more of operation depending on the initial and subsequent capital outlays. The cost implications will in most instances depict a 'j'-curve effect with costs increasing initially and then decreasing as a result of volume and reduction of unit cost.

Similarly the pressures on pure SST channel's profit margin will also be affected as there is this initial cost that will reduce the margin until the unit costs move below breakeven. There were two distinct viewpoints raised in the findings. One respondent stated that "we found that our investment in mobile was probably justified in terms of cost savings. So the whole investment was paid for. So it's like a one P/E". This means that the investment was recovered in one year after having the SST channel deployed.

Therefore, as a result of the responses received, there may not be a significant negative impact on profitability initially due investment in SST channels as the initial cost will be offset by the depreciation and revenue generated within the short term.

A few respondents also iterated that SST facility would require further innovation over and above the refinement expectation. Innovation would allow for increased revenue by virtue of cross sell opportunities. Clients and users would be offered innovative ways of interacting with their SST facilities and be steered into additional service and product uptake prospects.

When measuring the impact of an SST deployment on profitability, it is important to take into consideration when the SST was deployed. In many instances in the research it was noted that a negative impact on profitability was being experienced by the organisation as a result of the product cycle phase, but the expectation was that there would be an impact on profitability over time. Therefore the impact of SST deployment on profitability must be measured carefully and the stage in the product life cycle must be considered.

4.2.1.4. The 'jaws' effect increase

Littleton (1928, p.279) provided a very simplistic definition of profit as "profit has been designated as a surplus over and above the marginal cost of production, or as a surplus remaining after costs, including interest on all capital, and wages of all labour, have been met". This definition references the surplus between revenue and cost.

In the previous sections of this chapter, the generation of revenue and reduction of cost was examined with the research finding that SST channels may be considered responsible for

both scenarios. Taking this finding into consideration and the fact that most organisations aim to increase the margin or surplus between revenue and costs, it is becoming evident that SSTs have a positive impact on profitability.

This positive impact is strengthened by the fact that it extends beyond only generating profit to having the potential to increase the margin percentage. All the respondents agreed that by increasing the margin percentage or the ‘jaws’ effect caused by a reduction in costs overlaid by increased revenue generation confirms that the SST channel plays its role in terms of impacting profitability.

The respondents further mentioned that the widening of the ‘jaws’ were paramount to the success of any organisation. SST channels therefore provides the environment for this to be achieved. First, the SST channel as set out earlier in this study, has been designed to increase revenue by virtue of its ubiquitous and innovative nature. Second, as a result of the expectation of re-use of back end platforms and expectation of reduction of unit costs and/or cost to serve, the SST channel will apply pressure on the cost aspects of the ‘jaws’.

Considering the ‘jaws’ effect and the impact that the SST channel has on the profit margins, it would be prudent for organisations within this industry to consider investment in an SST strategy in order to contribute towards positive organisational performance.

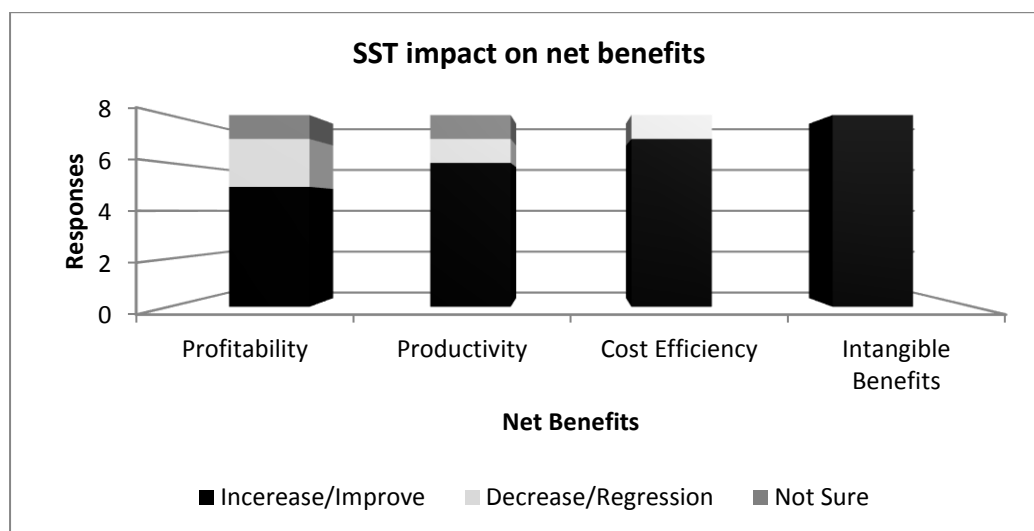


Figure 13: Respondents perspective of the impact of SST on organisational performance

In conclusion, the investment in SST channels were considered by most of the respondents to have a positive impact on profitability as a result of the factors stated above, and these

results are depicted in Figure 13 above. The two respondents that had expressed contrary viewpoints were as a result of the cycle dependency mentioned in this section. They expressed the view that they had experienced negative short term benefits; however they are expecting longer term benefits.

The next section examines the impact of SST investment on productivity.

4.2.2. Productivity

Saari (2006) described productivity as the result of converting inputs into outputs, while Yang and Klassen (2008, p.10) supports this description by validating that “Productivity measures what is the ‘output’ for a given quantity of ‘inputs’”. Productivity in the financial services sector is considered no differently within an environment where client’s financial transactions are processed in order for them to manage their personal financial position as effectively and safely as possible.

Financial institutions providing these facilities continuously want to improve on their processes in order to become more efficient and ultimately more cost effective to both their clients and themselves. The research examined the effect that SST channels have on productivity and the following findings were documented.

4.2.2.1. Improved efficiencies through self service

Self-service provides efficiencies based on providing convenience to the client. This convenience, as agreed by all the respondents in this study, allows the client to be serviced ‘anywhere and anytime’. The SST channel therefore provides the platform for the client to be in a position to process transactions and the like without visiting the physical branch network.

The research findings highlighted that efficiencies created through self-service is fundamentally about the straight through process (STP) and the fact that the client has the ability to process their transaction themselves.

One respondent supported this viewpoint by mentioning that “it’s about straight through processes, it’s about your ability to process that instruction or request seamlessly, automatically, timeously. Because it’s been initiated by the client the likelihood of error in terms of KBN Bank’s perspective will reduce”. However, this view was expressed due to the fact that clients do not usually make errors when transacting on their own account as they have a direct vested interest in their actions.

As a result of this reduction in error rates, there is an immediate reduction in re-work and capacity is created for improved productivity in other areas. This reduction in rework would equate to creation in capacity for staff to concentrate on other tasks or even result in a reduced administration workforce or complement within that organisation.

Four respondents included another contribution that SST has on efficiency. As a result of the fact that clients interacting with a system and transacting via it will allow the organisation to benefit if the correct STP infrastructure is in place. It is imperative that SST transaction process in full STP with front-end functionality integrated with the back-end product systems. Fully automated processes will also allow the organisation to create capacity as result of eliminating the human or staff assisted element as well as the elapsed time to process transactions.

The elapsed time to process transactions shortens the time to process and therefore benefits both clients from an expediency and turnaround perspective while on the other hand improves the conversion rate from input to outputs for the organisation on high volume items. Therefore an improved conversion rate equates to improved productivity.

The evidence above and in agreement with all the respondents, suggests that the deployment of SST within an organisation positively contributes to the net benefits from an efficiency perspective by reducing the human interaction, and allowing full system interaction with the client.

4.2.2.2. Shift from physical to SST channels

Throughout this document there has been a reverberation of a recurring strategic theme that focusses on shifting the physical branch network channels to a less cumbersome and cost heavy channel that will allow the organisation to achieve future benefits.

Ramsay & Smith (1999); Prendergast & Marr (1994) iterated in their research that there will always be a place in the business strategy of the banking industry for the branch network as it will always be considered a strategy. The modern strategy for the physical branch network would not be considered as a transactional channel as previously envisaged. The physical branch network needs to be supplemented or supported by the SST channel which will allow the organisation to provide a more holistic offering.

In addition, Bielski (2007) highlighted that although the banks have established internet facilities geared towards sales, there is a tendency to use it primarily for mundane transactions when offering SST in the branch networks. This shift, from a financial services

organisational perspective, is strategically significant for that organisation as staff assisted channels are associated with manual processes.

The feedback of four of the respondents have concurred that manual processes are, in practice, reserved for sales and acquisition while the more static transaction processes are reserved for SST facility processing. One respondent mentioned that:

So the more ATMs we roll out you see a shift in cash withdrawals from the branches. And this frees up capacity in the branches to do other transactions, to do selling. So you actually have higher order transactions you can actually do like selling, advisory services and the like.

The fundamental question within the organisation is whether there may be a beneficial shift from physical to SST.

The benefit from a productivity perspective is that there is a deployment of technology in the form of SST to provide automation and in turn provide efficient processes. These efficient processes are not brick and mortar dependent, and do not require human intervention thereby improving the productivity by a factor of ten according to one of the respondent. The motive for the shift to the SST channel from the physical channel was discussed in the previous sections of this paper and the theory is solidified with a positive impact on productivity which is consistently confirmed in the research.

4.2.2.3. Technologically servicing concurrently (non-human factor)

The previous section discussed the direct efficiency benefits as a result of the shift from the physical channel to the SST channel. However, the research raised a further extended benefit. The benefit highlighted an operational efficiency that is gained through the technological infrastructure's ability to offer concurrent interaction by users or customers.

Human servicing may only take place sequentially which means that a teller, for example, may only service one client at a time. This sequential serving allows for limited productivity as resource capacity is finite due to the cost factor. In contrast, the SST channels are developed on an infrastructure designed for concurrency. Concurrency may be described as when multiple clients or users are allowed to interact with a service or person at a single point in time. In the case of a human interaction, concurrency may not be much greater than one or two is to one. However SST facilities are purpose built for these types of interactions and have a ratio far greater than that of a human.

One respondent raised the fact that there are SST channels that are designed for 100 000 concurrent users as there are millions of clients dependant on these services on a daily basis. Considering the efficiency that the technology contributes via a SST channel in relation to human servicing, the impact on productivity within an organisation is positive.

There were two respondents who disagreed and believe that there is a productivity drain on their business as it readies itself for SST growth and maturity while expecting longer term benefits. The productivity drain was directed at the amount of set up, learning and exceptions that occurs when introducing a SST channel and facilities. The viewpoint was that the anticipation of increased processing volumes as a result of the ease of doing business will increase the exception management items that the administrators will be receiving.

In conclusion, the majority of the respondents agreed that the investment in SST channels have a positive impact on productivity as represented in Figure 13 above.

4.2.3. Cost efficiency

Cost efficiency may be described for the purposes of this study as the ability to increase revenue with the cost to generate that revenue increase remaining constant. Cost efficiencies are very closely associated with process efficiencies or productivity that was discussed in the previous sections.

4.2.3.1. Reduce the cost to serve

Campbell and Frei (2010) mentioned that organisations invest in SST not only to drive revenue increases but to benefit from the reduction in the cost to serve as a result of the reduction of the cost per transaction. The reduction in the cost to serve is primarily attributable to the SST channel.

The reduction of the costs associated with servicing clients may manifest itself in various forms such as reduction in error rates as accountability is shifted, and therefore obviates the need for people to process and the like.

First, the SST channel reduces the reliance on human capital due to its fundamental principles and therefore obviates the need for people. By virtue of the fact that there is reduction in human involvement, it would mean a reduction in the most significant cost line in any organisation, which aligns to all the respondent viewpoints.

One respondent supported this notion as follows:

So it (SST) really obviates the need for people, much more scalable and at the same time it's totally digitally driven. And we know what's happening with processing powers in banks, it keeps on getting cheaper. All of those contribute to driving costs down.

The second factor in the reduction of the cost to serve is the reduction of error rates. This is an external benefit that is client induced as result of the SST channel interaction. According to three of the respondents, the accountability of accurate processing is shifted to the client and therefore the organisation reduces the occurrences and risks associated with processing. Incorrect processing and error handling impacts organisation as the liabilities rests with the entity that processes the transactions. However, errors and inaccuracies have significant cost implications for organisation and therefore by shifting the cost, the quantum of losses are significantly reduced due to the SST channel.

Based on the findings above, it is evident that the deployment of SST channels has contributed positively to the reduction of cost to serve clients.

4.2.3.2. Reduce unit cost through fixed cost base

Bakos & Treacey (1996, p110) highlighted in their study that “the range of organisationally relevant measures of systems can be described using two dimensions of information technology, namely the functional components of a system (storage, processing and communications) and the performance characteristics of these components (capacity, quality and unit cost)”. For the purposes of this research exercise, the system performance aspects are of paramount importance and particularly from a cost efficiency perspective.

One of the performance characteristics listed in the measurement dimension is that of unit costs which may be described as the cost incurred by an organisation to produce a unit of product that includes both fixed and variable cost components. Therefore Bakos & Treacey (1996) emphasised that a primary objective of most organisations are to reduce unit costs in order to improve organisational performance.

The reduction of the unit cost of servicing is therefore considered an organisational expectation when strategic decisions are made whether to deploy SST facilities or not. As a result of the evolution of technological interoperability it is no longer costly or complex to build and deploy centralised platforms to support a myriad of SST facilities. Unlike the problems being experienced in the Eastern regions, Saudi Arabia in particular, where interoperability results in the lack of investment in infrastructure and hence inhibiting the adoption of SST channels (Wonglimpiyarat, 2014; Al-Somali, Gholami & Clegg, 2009).

From a cost perspective, the capital investment into the centralised platform infrastructure is therefore considered a once off cost, with cheaper SST integration facilities to follow as additional services are required. Furthermore, Sexton, Graves & Lee (1993) illustrates the impact on units cost as input increases in terms of the long running average cost perspective (LRAC) if all other factors remain constant namely the fixed platform costs in this instance. This effect is depicted in Figure 14 below. This viewpoint was expressed by six of the respondents.

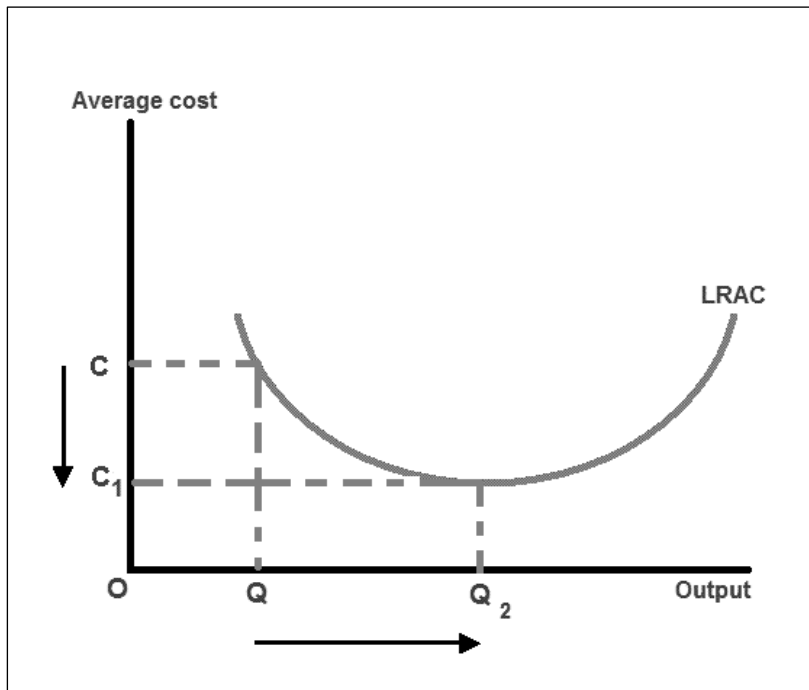


Figure 14: Impact on long running average costs as output increase

Source: Sexton et al. (1993)

Once the platform has been expensed and integrated to the various SST facilities, the cost of running the platform becomes fixed. Volumes will also be expected to increase as a result of the availability of SST facilities due to the adoption rates and the extended servicing. Once the volumes increase on a fixed cost base, the cost per unit of transaction will reduce and therefore the benefit of implementing an SST channel on a centralised platform hosting the product system, will impact positively on cost efficiency.

One respondent confirmed that the platforms and process costs of transactions on the various platforms cost 30% less than seven years ago. The same respondent further provided an example of a single department that were responsible for profile management

that had a staff complement of three hundred which has now been reduced to fifteen with the volumes being quadrupled.

The information being furnished by the respondents as well as their collective corroboration with the view that fixed cost bases' contributes to cost efficiency within an SST environment and further contributes to the fact that SSTs positively contribute to organisation performance.

4.2.3.3. STP is the primary contributor to reduce costs

Straight through processing (STP) is the technological improvement that is considered the foundational principle of the SST channel as recorded in the research findings. The reason for this statement may best be outlined as the overarching element of cost reduction that includes the reduction in cost to serve as well as the reduction of unit costs.

The additional benefit to consider with STP is the reduction of operational risk costs such as fraud as well as end-to-end processing such as back-end automated transfer payments and the like. STP allows the client to interact with the SST facilities in order to achieve their desired expectations instantaneously devoid of any human contact and/or intervention. One respondent supported the benefits of STP by quoting that "electronic transactions versus a self-service transaction is by a factor of 10 cheaper, so particularly if it's a straight through process".

Relative to the findings above, the overall sentiment regarding the impact of investment in SST channels on cost efficiency is considered to be positive by almost all of the respondents. These outcomes are depicted in figure 13 above.

4.2.4. Intangible Benefits

In the context of this study, intangible benefits within the organisation are considered to be those benefits that are not easily measurable. The most immeasurable benefit impacted by the deployment of SST, according to the literature and findings is that of customer or client servicing. In support of the research findings thus far, Jacks & Schilhavy (2011) in their review of e-business performance measurement systems highlighted that there were mechanisms to measure cost savings and transaction throughput but none that could measure customer or client services.

The findings highlighted that convenience, extended servicing hours, additional facilities and SST expectation management are the primary factors contributing to the SST impact on client or customer servicing. The following section examines this phenomenon individually.

4.2.4.1. Convenience factor imperative

The SST channel principles were designed for convenience. Rowley (2006, p.341) further described an e-service as “unlike traditional service, is not constrained by distance and opening hours, and thus delivers convenience”. The description factors in two important components of convenience from a service perspective, namely location and time.

All respondents responsible for retail banking services iterated that SST channels provide clients with the ability to transact or interact with the organisation via a convenient location in the form of an ATM based on a considerable geographical foot print for cash. The e-business and m-business solutions provide an even stronger negation of geographical impediments as it has negligible restrictions or limitation apart from connectivity convenience such as Wi-Fi or 3g coverage. Figure 15 below derived from research conducted by Green and Van Belle (2003) that supports the view that convenience is both important and advantageous for organisation that offers e-commerce facilities.

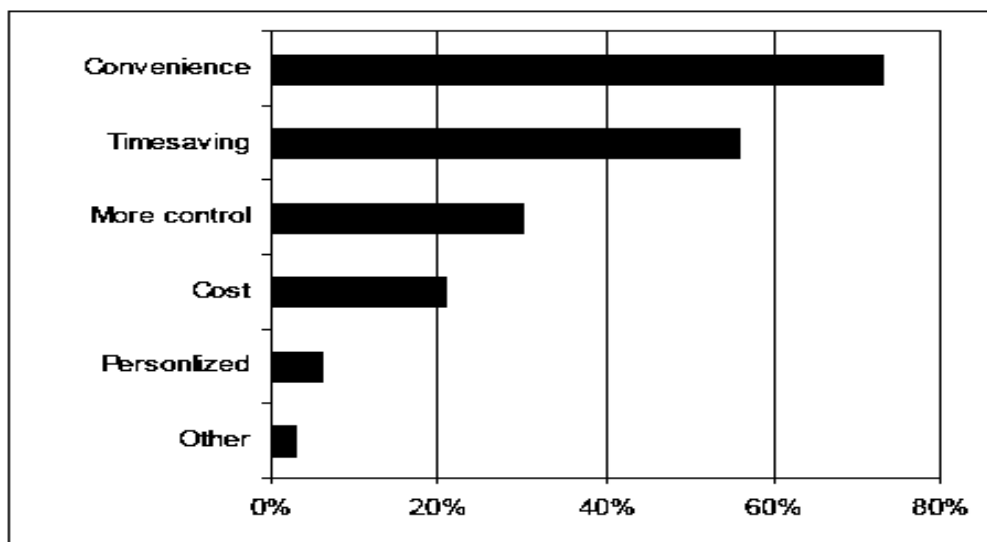


Figure 15: Perceived advantages of Internet banking

Source: Green & Van Belle (2003)

The SST facilities therefore allow for on-device interactions that allows clients to interact wherever possible and as a result the organisation provides one aspect of convenience and in so doing increase the positive client experience from a servicing perspective.

The other aspect of convenience is the time factor. The time factor pertains to the limitations that financial organisations contended with for decades, namely, the hours of services to

customers. In support of this, one respondent quoted that “the best gift you could give your client is time”. Manual operations had a limitation in terms of the maximum time that could be spent servicing clients due to human element as well as industry regulations in terms of reporting and valuations. The advent of SST revolutionised the industry from a client interaction and connection perspective by replacing some of the human aspects with systems.

These systems were designed and built to operate on 24 hour per day availability for 365 days basis and will only be down as a result of maintenance or outages. As a result, these SST facilities offer ‘anytime’ convenience to clients while providing additional improvement in client or customer servicing.

It is imperative that the convenience factor manifests itself in the deployment of SST facilities as it will enhance the customer experience and add to the positive impact on client servicing from an organisational perspective.

4.2.4.2. Provide additional facilities to meet needs

In the literature review references were made to Hsieh’s (2005) research on using SST as a competitive advantage and he, in addition, proposed that SST facilities must ensure that clients are service managed via two proposition statements, namely "Have it your way" and "Help yourself." Hsieh (2005) further iterates that satisfaction of these propositions should be at the forefront of any strategy to shift client servicing to SST channels.

There is a growing desire to shift as many of the servicing element to the SST channel as possible with organisation only being in a position at present to allow limited functionality to clients as hurdles such as risk, security and efficient processing has not been sufficiently elucidated. As a result of this shortfall there is a limitation to offer clients what they need via the self-service alternative. However, one respondent highlighted that “if I can make sure that the customer has the same level of customer experience on this (mobile phone) as they would have if they were sitting face to face, and then I have nailed it”.

Considering the above and the fact that the adoption of SST channels are successfully growing the financial services industry, there is a definite opinion that SST channels are meeting the needs of the clients hence there is, by definition, a positive impact on organisational performance.

4.2.4.3. SST expectation is a ‘stepped’ change effect

Seven of the respondents highlighted that servicing is no longer a competitive differentiator. Service from an SST perspective has different expectations depending on the user. Three respondents further mentioned that an SST facility may be considered ground breaking to an older, less technologically inclined user for example, while a younger ‘Y’ generation user that has grown up in the digital era would consider the same functionality to be ordinary. The quality of servicing is therefore relative to the user’s expectation based on past experiences.

Similarly, the clients who interact with SST channels with various institutions embrace new functionality easier and very soon thereafter it becomes the norm and fosters expectation on all other platforms. This behaviour and expectation is considered the ‘stepped’ change effect that impacts on the organisation’s evolution and improvement that is required to continuously be competitive while maintaining a freshness of engagement with the client.

The findings have highlighted that this factor manifests itself in the South African industry with particular reference to the organisation that is considered to be the forerunner within the industry. The head of online banking at First National Bank attribute the success of their SST strategy as follows: “What we have learned in the almost 12 months that we gained a first mover advantage, is that simplicity and ease of use really is the ultimate sophistication” (Muller, 2012) . This statement confirms the benefit of ‘first mover’ advantage from a servicing aspect and also supports the business strategy of the organisation as it acquired 1.3 million net new clients.

The ‘stepped’ change effect as well as the ‘first mover’ advantage from a technology perspective provides the necessary support to suggest that the impact of SST channels on client servicing perspective may also be considered positive which aligns to the literature review research.

In conclusion, there is enough evidence highlighted in the findings above to support the notion that the convenience factor by virtue of the meeting of client needs and the ‘stepped’ change effect provided by SST channels, has a positive impact on client servicing and ultimately the organisational performance. These findings are depicted in Figure 13 above. The findings have thus far examined the investment in SST as well as the impact of SST on organisational performance constructs. The next section will further examine the relationship dynamics between investment in SST and organisational performance construct.

4.3. Relationship Dynamics

Ou et al. (2009, p.447) mentioned in his research that “IT providers can better plan and more accurately predict ATM development and usage by studying the relationships between IT investment and firm performance. This view was expressed broadly across the SST channel in the findings, however it did not only pertain to planning and development but all other aspects including the impact on organisational performance.

The relationship dynamics for the purposes of this study will focus on two aspects, namely the three specific ‘pairwise’ relationships raised in Petter et al. (2008) research as well as the causality between the two previously examined constructs. The scope of the analysis of the relationship dynamics in the proceeding section are depicted within the white circle of figure 16 below. This depiction of the relation dynamics are relative to the other constructs being researched within this research project.

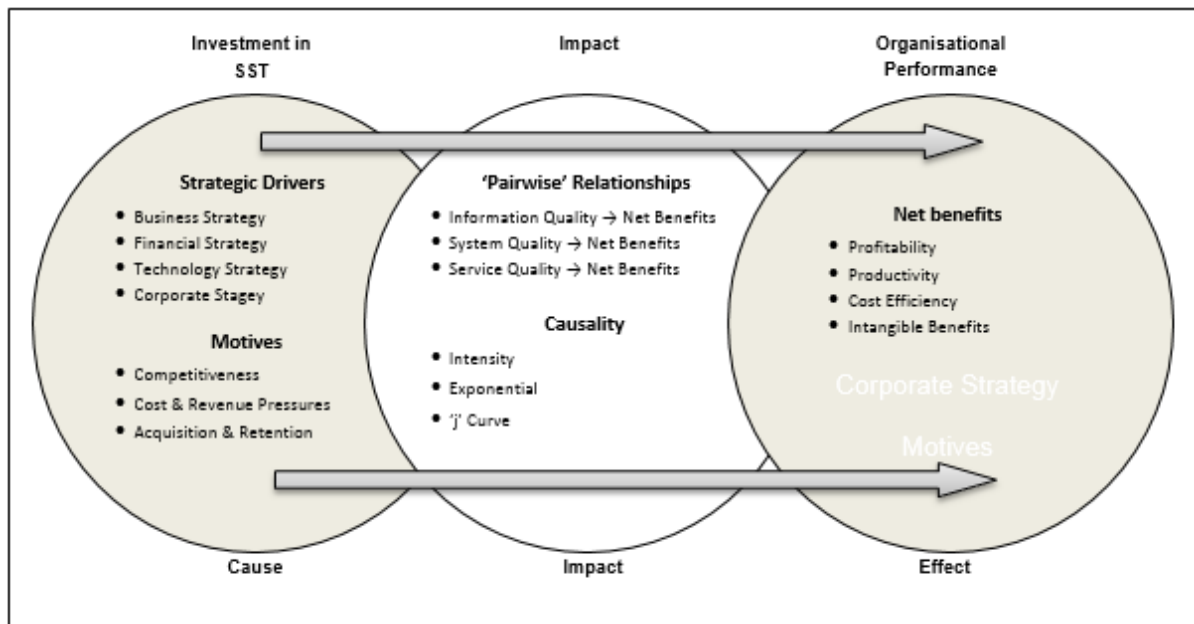


Figure 16: The scope of the relationship dynamics research

4.3.1. ‘Pairwise’ relationships

Petter et al. (2008) study, as referenced in the literature review, identified 15 dimensional relationships that existed within the DeLone and McLean model for IS success (2003) with three relationships types aligning itself to the objectives of this study. The three relationship types focus on the relationship between the quality aspects (referring to the investment in SST) and net benefits (referring to the organisational benefits).

4.3.1.1. Information Quality → Net Benefits

As described earlier in this study, information quality is one of the system quality aspect within the DeLone and McLean model for IS success (2003) that represent the client or business information being generated by the system (Pérez-Mira, 2010). In this context the DeLone and McLean model for IS success (2003) measures the relationship between information quality and its impact on net benefits. This relationship has been studied in the past, however, there are no conclusive statement to confirm the intensity of the relationship, namely weak, moderate or strong. Figure 17 below, the blue line depicts the 'pairwise' relationship that is being focussed on in this section of the study.

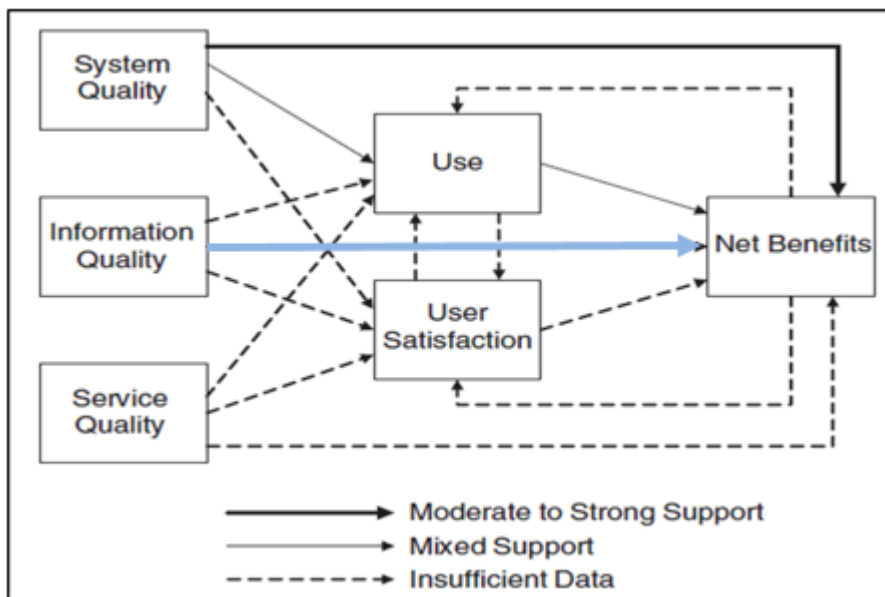


Figure 17: D&M model of IS success at organisational level: Information Quality → Net Benefits

The literature review highlighted a differing of viewpoints between Petter et al. (2008) and Gorla et al. (2010) with a moderate and strong relationships being confirmed respectively. Petter et al. (2008) considered the relationship moderate for the fact that it there was an inability to conclusively measure the relationship as well as the fact that there was a lack of research on it. The common juncture between the two viewpoints or findings are that there is no negative or weak relationship prevailing. These relationships were further examined with the findings set out below.

STP improves accuracy factor

The majority of the respondents concurred that systems that employ straight-through-process (STP) allow for systems to manage themselves based on audit reporting and the like. SST capabilities leverage primarily off these infrastructures and which contribute to their successes to date. The deployment of STP, as mentioned earlier in this study, does not rely

on any human intervention except for the end client inputs. This process allows for the reduction of errors and transfers the responsibility to the client.

The 'self' organised system or infrastructure therefore processes and generates accurate and audited information to the client based on their inputs. These outputs contribute significantly towards behavioural aspects such as trust as these are financial records being transacted upon. Furthermore, Montazemi & Qahri-Saremi (2015) highlighted that from a financial services industry perspective, clients were more likely to sacrifice service and/or system quality above information quality as accuracy of the investment or bank account information is considered more important.

SST channels are primarily deployed on STP platforms and therefore would leverage off system quality aspects mentioned above. SSTs therefore allow the organisation to improve on the accuracy factor required to meet clients' needs and therefore contributes to those non-negotiable attributes.

Creates a trust relationship

All respondents unequivocally confirmed that information that is provided to clients regarding their financial status must always consider the attribute of accuracy as a non-negotiable. If system or reporting accuracy is compromised, then the integrity of a system is called into question. Once the integrity becomes a concern, then the organisation's trust values are highlighted.

The financial services industry has the value of trust as bedrock of its proposition and therefore may not, at any point, have clients doubt that. Chung and Kwon (2009) iterates that there is a direct correlation between client satisfaction and trust. If a system is trusted from an information quality or system quality perspective, then it is more likely that the adoption will be improved. This is a fundamental behavioural aspect that organisations must focus on.

An organisation that places the system accuracy high on their systems attributes priority will achieve the required benefits by virtue of client retention and acquisition. Clients who have constant or even intermittent data accuracy issues are more likely to leave the organisation than continuously accept these issues.

Green and Van Belle (2003, p5) supported this view in their research of client expectations of South Africa by highlighting that 'It was felt that a lot of this trust had to do with banks working hard to create this perception of safety and trust'. Their research aligns itself with the

views expressed in the findings and it was strongly confirmed that there will be an impact on net benefits if trust is not built with the client and particularly in the form of accurate reporting.

All respondents highlighted that system accuracy builds a trust relationship that will ultimately strengthen the impact on organisational performance.

Appropriate value proposition offering

Conversely, the organisation would use SSTs as their source of management information when making critical decisions regarding servicing, product development and so forth. SST channels or facilities as mentioned earlier, have the necessary reporting capabilities to provide the required management information as it records all the client-to-system and system-to-system interactions.

This type of data is easier to extract from SSTs than from physical branch networks as inter-human interactions considered to be interpretive and not unambiguous. An example provided by one respondent around making decisions in terms of whether an ATM facility is in the correct location from a profitability perspective, may purely be derived from the usage and transaction processing statistics extracted from the system reports. These figures will be unambiguous and free from interpretation and will allow accurate decision making.

The management of these organisations however, will be required to make higher level decisions based on the information generated from the SST interactions. These decisions will be made with the focus centred on the client experience regarding attributes such as the most effective interaction dynamics, the optimal product mix offered and the most optimal service application offerings. The success of this type of leverage received from SSTs will allow the organisation to improve its net benefits as result of the system accuracy.

The improvement in net benefits will be derived from an increased revenue due to the organisations ability to expose more product to the clients as a result of understanding their behaviour which will inform possible needs or product gaps. This informational quality aspect will also allow the organisation to direct clients to facilities that would obviate inconvenience and inefficiencies being experienced and therefore generate the necessary revenue and/or cost saving from those SST facilities. All the respondents iterated this position and agreed that information quality in this regard will provide opportunity to impact net benefits if harnessed fruitfully.

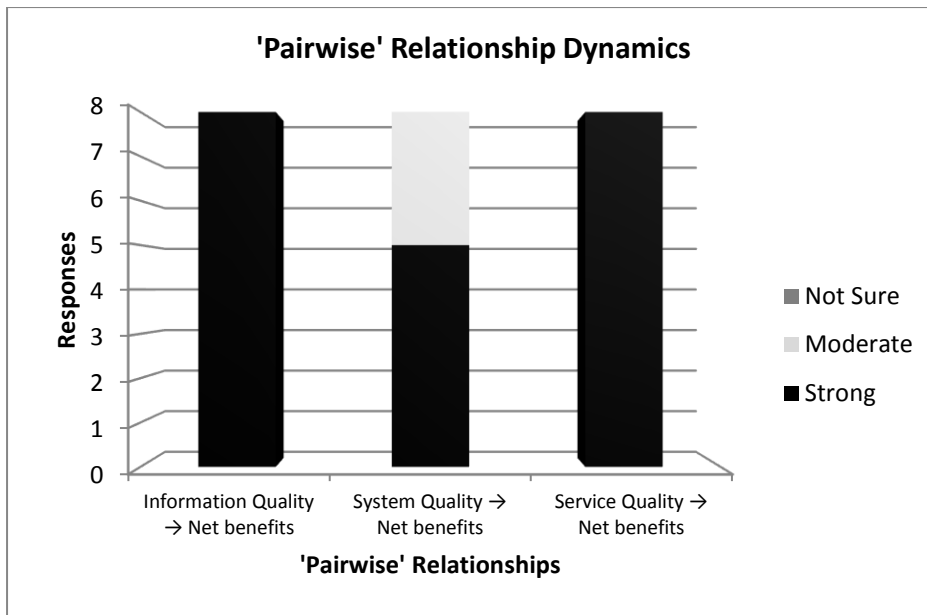


Figure 18: 'Pairwise' relationship findings

In conclusion, there is a convincing viewpoint expressed by all respondents that the relationship between information quality and net benefits are strong and that organisations must consider this as an important factor when implementing a SST channel. These findings corroborate the research findings of Gorla et al. (2010) in the literature review and are depicted in Figure 18 and marginally contradicts the views expressed by Petter et al. (2008) who considered the relationship as moderate due to a cautionary outlook as a result of the inability to measure its impact scientifically.

The research finding in terms of the intensity of the relationship between information quality and net benefits are considered strong when taking into account factors such as accuracy of information, ensuring a trust relationship and offering added value on system generated information. These factors provide an end-to-end link between the two constructs and it is considered positive and strong.

4.3.1.2. System Quality → Net Benefits

The literature referenced the fact that system quality as a result of efficiency impacted sales and ultimately organisational performance when viewing an e-commerce platform. The literature also highlighted that there was a strong view portrayed that the expectation of the relationship between system quality and net benefits would be strong (Gorla et al., 2010).

However Petter et al. (2008) listed this relationship as strong to moderate based on the Figure 5 in this study, as a result of the findings not being conclusive at all types of technologies and/or within various levels of organisations. For example, there were strong

relationships at 'formal' firms but only prevalent at certain levels in entrepreneurial' organisations (Petter et al. 2008). Even though these findings were documented at an overall information systems perspective, there was no evidence that the same applies to the SST channel landscape within the South African financial services context.

The research finding highlighted specific themes that supported the intricacies of this 'pairwise' relationship. Figure 19 below emphasis the 'pairwise' relationship that forms the basis of the research findings in this section.

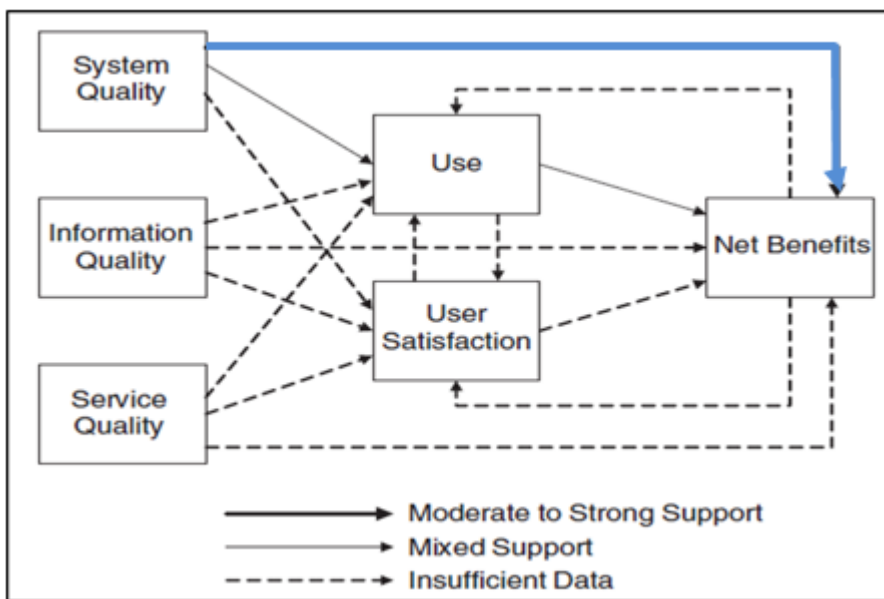


Figure 19: D&M model of IS success at organisational level: System Quality → Net Benefits

Ease-of-use drives adoption

A significant attribute of system quality is the system's 'ease-of-use'. The ability for a client or user to navigate a SST facility would allow for them to become at ease with the facility and channel. This navigation comfort will allow for an improved client experience.

Petter et al. (2008) suggests that 'ease-of-use' is commonly associated with perceived ease of use which is a fundamental component of the TAM model (Davis, 1989). This would then imply that ease-of-use should be measured according to the TAM model. However, Petter et al. (2008) strongly contradicts this assertion by confirming that system quality or ease-of-use measures according to the DeLone and McLean model for IS success (2003), takes into account portability, reliability, understandability and the like. TAM (Davis, 1989) only takes usability of a system into account when measuring perceived ease-of-use and therefore

would fall short of the actual objective of the measurement as the broader factors are key to SST ease-of use measurement.

SST facilities are principally designed for ease of navigation and excellent client experience in order to retain and acquire users. Therefore the ease of navigation will ultimately be responsible for the increase in SST adoption rates. However, the converse would purport that if 'ease-of-use' is below standard in relation to the industry these same adopters may become, as described by one respondent, an evangelists of 'doom' with possible negative retention taking place at a rapid rate due to opportunistic competitors or unsatisfied clients.

Another respondent highlighted that a negative ease of use experience may alternatively drive users to return to the more costly physical branch network channel and therefore the organisation may risk margin pressure and ultimately endure an impact on organisational performance in the form profit suppression.

The views expressed by all respondents in the findings therefore recognise the 'ease-of-use' or system quality relating to the investments and deployment of SST channels have an obvious strong relationship to organisation performance as the expectant adoption rate will attribute increase revenues.

SA 'duality' needs to be catered for appropriately to acquire volumes

Another aspect to consider in the South African context is that of 'duality'. The 'duality' component arises as a result of the distinct demographic landscape in South Africa as highlighted earlier in this document. The smartphone adoption in this country has been dominated by the high and middle income segments who account for a smaller proportion of clients or users. This market targets a specific level of user sophistication and the levels of intuitiveness that is similar to the developed industries.

The balance of the market is a large mass market segment that has a significantly different requirement from SST channel perspective. For example, cash is the primarily medium of payment while feature and entry level mobile phone technology is the order of the day. Therefore the SST channel strategy would need to be significantly different in this respect.

Salhieh et al. (2011) and Wonglimpiyarat (2014) raised the impacts and challenges that 'cash only' societies have on the SST channels in other countries. 'Cash only' societies hamper adoption primarily due to cultural factors such as the religious condemnation of interest receipting in Jordan to the high perceived risk of SSTs being experienced in Thailand. The South African context or financial services industry has a less intense position on cash,

however a respondent highlighted that cash would be the preferred medium in many instances due to the perceived complexity of the banking system by a mass market user base that has a limited level of education as a result of the country's history.

From an electronic medium perspective, respondents envisage that adoption would be successful if feature phone applications were made available for transacting with very low complexity. This approach would encourage usage and therefore increase adoption.

As a result of this, a different dynamic arises and without the necessary focus there would be significant impact on the organisation considering that the mass market segment accounts for the greater demographic numeric in South Africa.

It is therefore important to allow the organisation to invest in an SST strategy that encompasses the duality aspects of the market and allow varying levels of 'ease-of-use' to ensure adoption and drive up volumes in the various segments. This in turn, will impact on the organisation's performance as a result of increased revenues

Relationship intensity

The research questions the dependency of net benefits or organisational performance on the investment or deployment of SST. The findings of this relationship were considered to be moderate to strong by all the respondents.

The primary argument ensued when prioritising system quality aspect to those of information quality and service quality. There was a very strong opinion that if ease-of-use were to be prioritised against output accuracy or reliability, then the strength of the relation to net benefits would not be considered strong. It is believed that clients and users would accept a SST facility that has less than excellent 'ease-of-use' or navigation depth if the facility portrays strong accuracy and reliability.

These views are also expressed by Montazemi & Qahri-Saremi (2015) who have confirmed that users within the banking and financial services industries would categorically prefer information quality in the form of accurate reporting over system quality in the form of ease-of-use. Clients and users have a psychological tendency to expect accuracy when dealing with their personal finances and will accept lesser quality navigation (Montazemi & Qahri-Saremi, 2015).

In conclusion, the findings have highlighted that system quality has a beneficial relationship with net benefits and has the potential to drive up volumes and revenues. Although this

viewpoint was highlighted, the relationship was considered strong to moderate (depicted in Figure 18 above) from an SST perspective and is corroborated by the findings of both Petter et al. (2008) and Gorla et al. (2010).

4.3.1.3. Service Quality → Net Benefits

Service quality was the newest dimension that was included in the revised DeLone and McLean (2003) model for IS success. The literature review has iterated that as a result of the late inclusion of this dimension in the model there is definitely a lack of research pertaining to it and in particular its relationship to net benefits (Gorla et al., 2010 & Petter et al., 2008).

The service quality aspects refer to the reliability, responsiveness, competence, access, availability and the like (Petter et al., 2008 & Zhu et al., 2002) and aligns itself to the attributes expected in SST channels.

Service quality is primarily measured by using the SERVQUAL framework (Zhu et al., 2002; Parasuraman et al, 1988; Parasuraman, Zeithaml & Berry, 1991). SERVQUAL is service quality framework derived to measure service quality within various industrial sectors including the use of information systems in the banking and financial services sector and by extension it must be adhered to within the SST channel as well. Prudently, Parasuraman et al, (1994) highlights that organisational lessons learnt from the results of the framework must be adhered to if system quality success is aspired to.

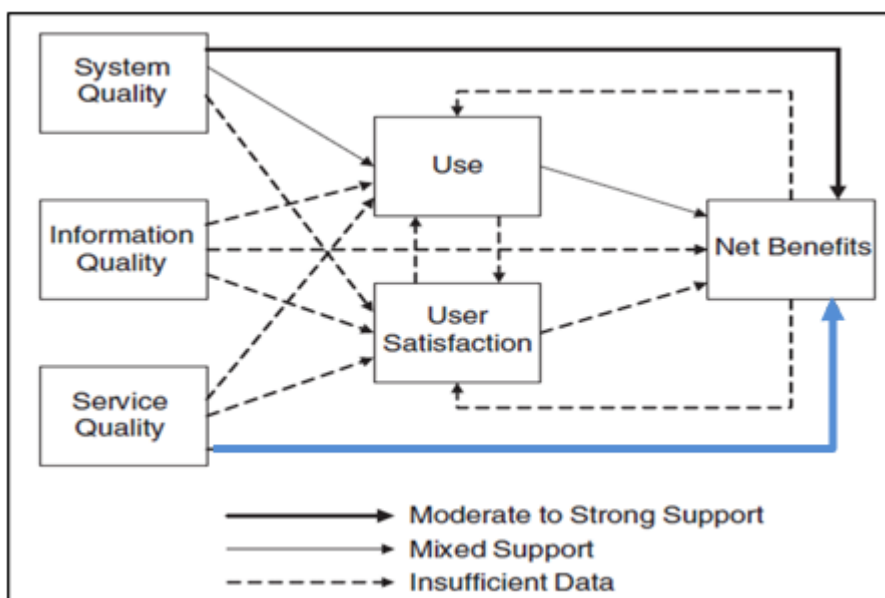


Figure 20: D&M model of IS success at organisational level: Service Quality → Net Benefits

Various themes were highlighted by the respondents when addressing the relationship intensity between service quality and net benefits and are articulated in the following sub sections. The 'pairwise' relationship between these two constructs are depicted in Figure 20 above relative to other relationships within the DeLone and McLean (2003) model for IS success.

Non-negotiable

A SST facility has to maintain 24 hour per day availability for 365 days availability for clients and users which relates to the attribute expectations contained within the service quality aspects. The findings have highlighted that these attributes are important from a financial services organisation perspective as clients and users require convenience in the form of services such as cash withdrawals, transaction conclusions and the like.

Earlier in the research and illustrated in figure 15, Green and Van Belle (2003) iterated that that convenience is considered the highest perceived advantage of internet banking. Cogitating that the confirmed notion that there is a high perceived advantage factor associated with convenience, it is imperative that it must be considered as non-negotiable.

Considering that the convenience factor is synonymous with the SST channel and plays a critical role in its adoption, it was highlighted that service quality is non-negotiable. System quality is therefore non-negotiable as it will affect the SST facility adoption and retention rates. A respondent stated from a client's perspective that "it's strong (the relationship). If that sucker is down twice in a row, then you going to move to another bank". A SST facility that offers ease-of-use and effective accurate reporting may not be effective if it lacks reliability, accessibility and the like.

One respondent highlighted that the service quality is becoming easier to offer and maintain due to the advancement of the technology platforms and that this should no longer be a future inhibitor to providing consistent service to clients. In the past, infrastructure and software interoperability was lacking, however huge strides have been made in this respect which allows systems to operate longer and to a certain extent operate in a self-organising manner.

The finding confirmed by the majority of the respondents that the organisation prioritises service quality as non-negotiable while considering it as a primary contributor to net benefits as it promotes acquisition and fosters retention.

Direct contributor to client drop off rate

In previous sections of this research exercise, the findings based on respondent feedback highlighted that any organisation would require a retention strategy that would include an SST component in order to provide the opportunity for future prosperity.

Considering the overall business strategic imperative, service quality must ensure that reliability and availability is considered the minimum requirement of any SST facility or channel. The organisation, importantly based on the respondents' feedback, deems these minimum requirements to be the 'ticket to the game' and believes that it would negatively impact net benefits if they are below standard. The 'ticket to the game' is considered by the respondents to be what clients and users expect a 'non-commoditised' attribute (Carr, 2003) that cannot be ruminated as a competitive feature.

An example expressed by one of the respondents highlighted that a campaign focussing on a SST facility enhancement or implementation that does not deliver as expected will first, increase telephone query generation in the service centres. If the issue is not resolved within 4 to 6 weeks, then a client 'drop-off' rate will be experienced as clients are intolerant of a facility that is unreliable. Service quality is a critical issue for both consumers and service providers. Parasuraman et al. (1994) listed system reliability as one of their top ten lessons learnt from a service excellence perspective. The emphasis was placed on the fact that if a system service was deemed to be unreliable by clients and users, then it must be understood that apologies and great personal service will not serve as compensation in any form.

A respondent believed that this scenario could be reversed and highlighted that with a strong focus on acquisition and not retention, there was the possibility to target clients and users based on a reliable and user-friendly approach towards system delivery. This approach and focus would drive a positive delivery mind-set within the organisation and extend to client and user satisfaction and adoption. The focus on acquisition rather than retention should equate into positive organisational performance as it would imply that drop-off rates would be negative.

Client 'drop-off' rates affect retention rates and these impact revenues, therefore it is evident that there is a relationship between the service quality standards and its adherence to from a SERVQUAL perspective (Parasuraman et al., 1994) and net-benefits.

Impact on organisational performance

Petter et al. (2008) confirms that the service quality to net benefits relationship has been afforded the least amount of focus from a research perspective due to this dimension being

the youngest of the interrelated constructs within the DeLone and McLean (2003) model for IS success. It is therefore important to carefully consider the feedback from respondents in order to understand the dynamics that are pertinent to this dimension in relation to the other constructs. Gorla et al. (2010) positively relates service quality and its impact on organisational performance as a result the application of frameworks such as SERVQUAL.

From a practical research perspective, the impact on organisational performance or net benefit by service quality was considered by all respondents of this research as strong. The reason attributed to this finding was articulated from a negative performance perspective highlighting the repercussions of not providing for minimum service quality standards. The respondents iterated that not offering highly reliable and available SST facilities would prove to be non-competitive and factors such as these must be viewed as 'non-commoditised' features or functionality.

All respondents acknowledged that the SST channel was designed to conclude high volumes of transaction for clients and user alike. These high volumes will equate to high consolidated values and therefore have a high impact on overall value of assets that the organisation manages. The quantum of assets being managed by an organisation converts to both interest or value based revenue as well as non-interest revenue.

As documented in this section, poor service quality pertaining primarily to reliability and availability would cause disillusionment of the credibility of the SST channel. This disillusionment would result in drop off rates with the end result being a reduction in revenue which negatively impacts profitability. The converse of this would mean that a SST facility that postulates strong reliability and availability would translate into increased volumes thereby improving organisational performance from a profitability, cost efficiency and productivity perspective. These findings were conclusively agreed upon by all respondents and are graphically represented in Figure 18 above.

In conclusion, the research has provided a conclusive viewpoint regarding the three specific 'pairwise' relationships that Petter et al. (2008) had listed as lacking in evidence. Figure 21 below is a modified version of Petter et al. (2008) study that confirms the findings of this research diagrammatically. The two relationships, namely Information Quality to Net Benefits and Service Quality to Net Benefits are considered strong by all the respondents (depicted as a red arrow). The respondents concurred with Petter et al. (2008) research findings that the System Quality to Net Benefits relationship is considered strong to moderate as the respondents were of the view that clients and user within the banking and financial services

industry would sacrifice ease-of-use over accuracy. Therefore system quality may not conclusively have an impact, both positive nor negative, on organisational performance.

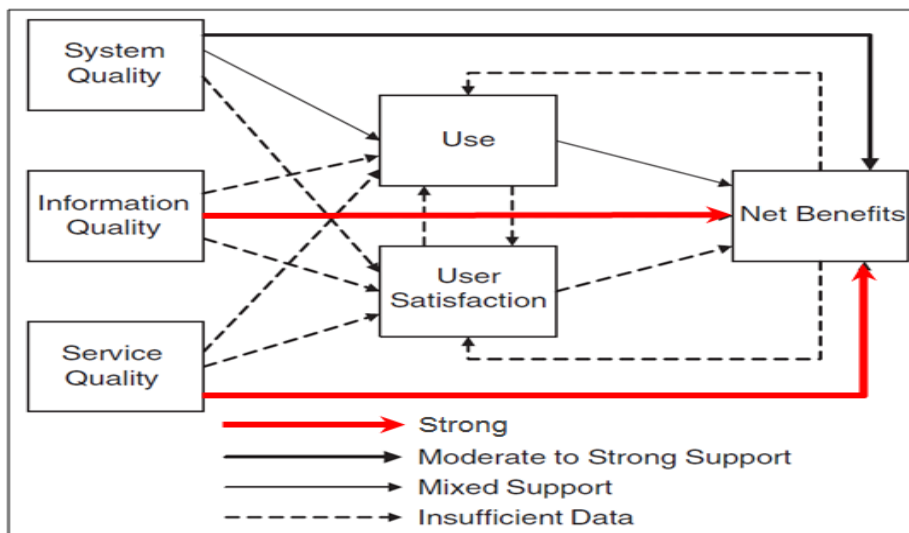


Figure 21: Modified support for interrelationships between D&M model of IS success at organisational level

4.3.2. Causal relationship

The DeLone and McLean model for IS success (2003) is a theoretical model that is based on a six multi-dimensional constructs and are associated with each other via causal relationships. Considering that the research findings to date has conjured the fact that investment in SST have an impact on organisation performance. As an extension to these findings, it was further highlighted that there are ‘pairwise’ relationships that are prevalent when considering the SST facility and channel quality relationships to net benefits.

This section will further examine the relationship construct but purely from a causality perspective relating to the investments in SST and organisational performance. The objective of this examination will be to understand the type of relationship that exists between the two constructs as well as unearthing their subjective behaviour towards the relationship. The behavioural aspects of the relationship would be considered in the context of how organisational performance would react to investment in SST.

The section below will examine these aspects separately.

4.3.2.1. Relationship Dynamics

Causality may be defined according to the Oxford English Dictionary as “the relation between an event (the cause) and a second event (the effect), where the second event is understood

as a consequence of the first” (Simpson & Weiner, 1989). The description of causality aptly describes the relationship between investment in SST and its impact on organisational performance.

According to the research findings, all the respondents categorically agreed that the relationship between the two constructs were causal in nature. The viewpoint was explicitly expressed when addressing the topic of causality within the relationship as well as during the impact on organisational performance. A few of the reasons attributed to the causality effect were the fact that investment in SST would allow for the reduction in costs and improvement in efficiency that will accelerate adoption and improve retention. These factors ultimately generate increased profitability, from a non-interest revenue perspective, which is the primary objective of shareholder based organisations (in most instances).

This causal relationship dynamic is therefore dependent on the initial event, which is the investment in the SST channel and its facilities. Once this investment is made the secondary event or ‘effect’ occurs which is the enhanced organisational performance including an improved financial standing.

4.3.2.2. Intensity of the causal relationship

The intensity of the causal relationship was between the investment in SST channels and organisational performance is deemed as strong by all respondents and is supported by the results of the findings in Figure 22 below. This response was confirmed at various points of reference during the impact on organisational performance and the specific ‘pairwise’ examination.

The reason for the causal relationship being considered strong is based on the understanding of the objectives and impacts that affect the organisation. The impact of not focussing on or being devoid of having a SST investment strategy or SST strategy in the current economic and competitive environment is believed to be detrimental to any organisation. The negative effect or consequences of not having a SST strategy would be as a result of not offering convenience for clients or customers and thus cause client ‘drop-off’ rates which will negative impact on revenues. In addition, as mentioned in this study, the future of banking is self-service or digital and organisations are obliged to maintain the competitive edge from a service perspective or risk the prospect of losing the benefits of a the SST channel offering.

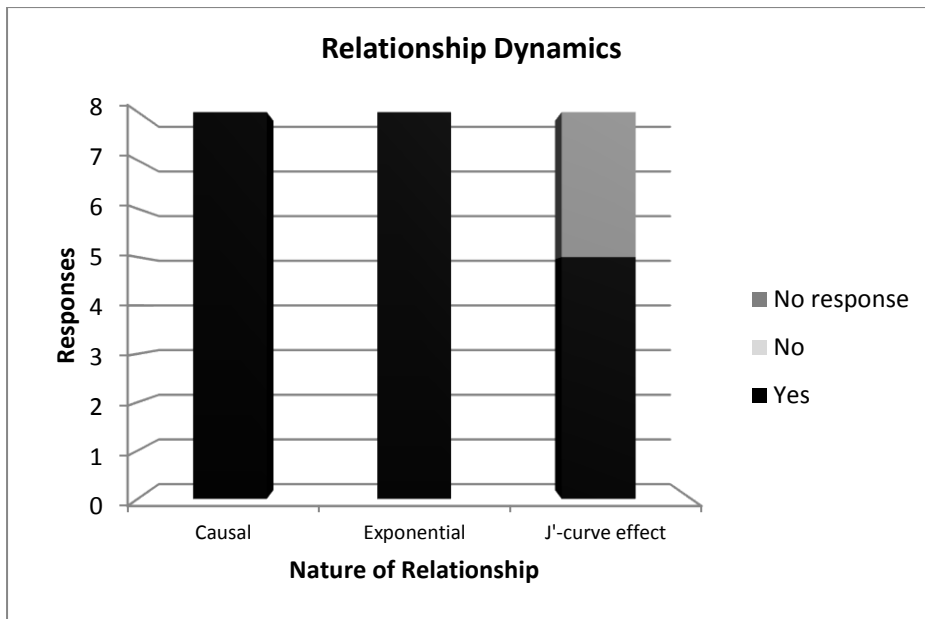


Figure 22: Nature of Relationship findings

Conversely, the effect of investing appropriately in an integrated client SST strategy would provide strong consequences in the form of improved organisational performance with client adoption or acquisition, client retention and the benefits of reducing the physical branch as being the key strategic drivers for that.

The only evidence of exception of a consistently strong reference to the causal relationship was the relationship between system quality and net benefits. Figure 18 above illustrates that three respondents considered this relationship as moderate due to their perception that clients and users would not compromise on information quality when performing financial system interactions, however they would accept less than perfect ease-of-use. This viewpoint dilutes an 'absolute' strong relation intensity between the two constructs and validates that there are varying levels of importance placed on the system quality aspects.

The evidence presented allows for the unequivocal confirmation that there is a strong causal relationship between investment in SST and organisational performance and hence highlights that the former construct impacts the latter. The next section examines the nature of the causal relationship.

4.3.2.3. Exponential in nature

The 'effect' or consequences aspect of the causal relationship regarding the impact on net benefits needs to be understood in terms of the nature of the relationship.

None of the respondents considered the nature of the causal relationship to be linear and neither was there the expectation of a 1:1 return ratio. A linear relationship may be described as a relationship that has a proportional impact on its variables as they move along a continuum, namely time, quantum or any other measurable variable. In most cases they are equidistantly measured along their continuums in a ratio of 1:1. The respondents expressed a viewpoint that investment in SST channels would not return a proportional impact on organisational performance and they would rather expect another form of relationship behaviour when investment is made in the SST channel.

This viewpoint is based on the fact that there are static underlying backend or product systems scale easily to accommodate increasing volumes of client or user interactions. Considering this scaling of systems and the expected reduction in the unit cost to serve via a SST platform, it would not be practical to expect a 1:1 proportional relationship curve and therefore scenario where every rand investment in SST the organisation would benefit to the values of one rand would not exist.

The nature of the relationship was confirmed by all respondents as exponential growth with findings depicted in Figure 22 above. Exponential growth as agreed to in the interviews was described as the gradual growth of one construct along a curve that increases by a factor as result of the other variable or construct increasing equidistantly. Therefore the premise would be that organisational performance would increase as a result of the investment in the SST channel by a ratio greater than 1:1.

All respondents confirmed that the organisational benefits were considered to grow gradually based on the effect of the cost savings and increased revenue as more capital was invested into the SST channel. By extension and as mentioned, all the respondents agreed that there is exponential growth relationship between the two constructs being studied namely investment in SSTs and organisational performance.

Considering that the causal relationship between the two constructs examined in this study is exponential in nature, it would be prudent to understand to what extent or factor the organisational performance would grow as a result of continuous investment into the SST channel. The respondents provided a varying forecast of growth in organisational performance of between 10% and 90% of increase in future cost savings or revenue increase as a result of investment in SST channels.

A respondent highlighted that the organisation should be targeting a 1:3 growth ratio in the short term while the expected attainment of 1:10 should be targeted in the long term. The

ratio is based on the expected return in rands for every rand spent. These variances may be attributed to the fact that some respondents were forecasting based on a reduction in efficiency ratio which is the financial measure of organisation's expenses against revenues.

The findings therefore confirms that the relationship between investment in SST and organisational is exponential in nature.

4.3.2.4. 'J'-curve effect

Although there is a consensus that there is a strong causal relationship between the investment in SST and organisation performance while being exponential in nature, five of the respondents added another dimension to the relationship dynamics in order to define it even further. The views of the respondents are depicted in Figure 22 above.

The study revealed that the expected benefits realisation would be cycle dependent. After the deployment of SST channels and facilities, the initial investments costs would therefore impede any savings in cost or increased profitability. SST channels will therefore deliver negative organisation performance or net benefits over the short term as cost-to-serve and the 'jaws' effect on profitability will be high and narrowed respectively. This would mean that the initial cost will require volume and adoption rate increase to reduce the unit costs and improve profitability once the product moves out of infancy into the growth stages of the product life cycle.

This effect, as termed by the respondents, is the 'j'-curve or 'hockey stick' effect. The investment in SST channels influences organisational performance in the form of a 'j' curve with short term underperformance and medium to long term outperformance.

The findings encompassed three constructs, namely investment in SST, the impact of SST on organisational performance and the relationship dynamic between the two constructs. The constructs and their salient research attributes are outlined in Figure 23 below which graphically provides the ambit of the study and its findings.

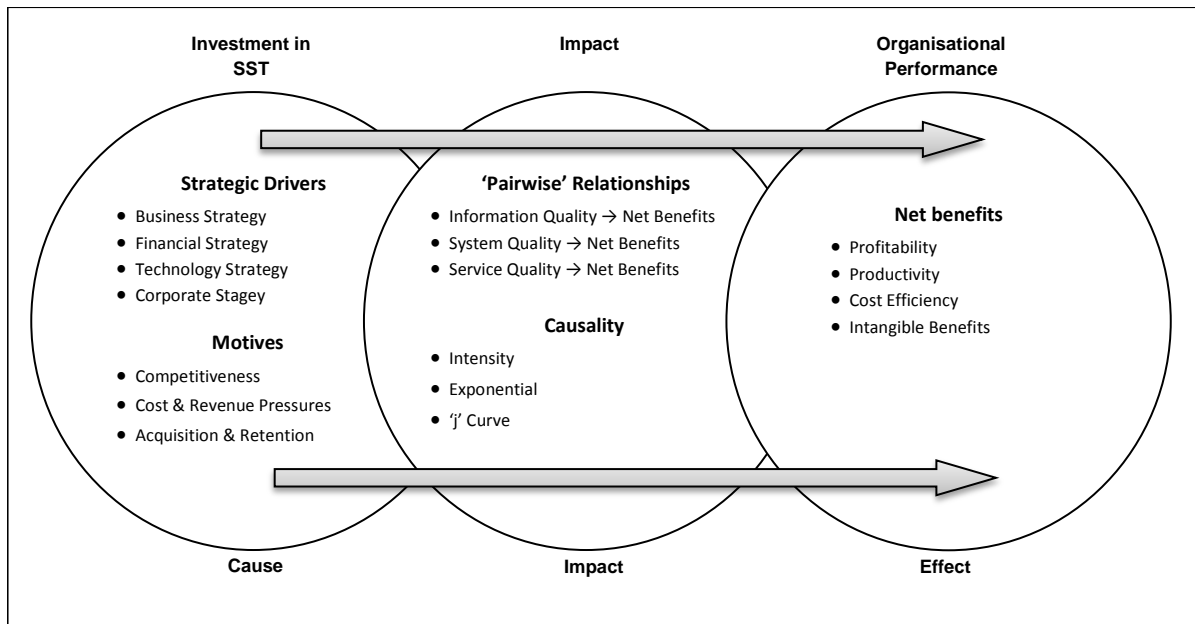


Figure 23: The realm of the research focus

5. Conclusion

In order to provide a conclusion to this research project, it would be prudent to revisit the research objectives and questions set out in the introduction section of this document. This section will outline the conclusions to each of the research questions.

5.1. The primary research question

RQ1 - What is the impact on organisational performance as a result of investment in self-service technology within the South African financial services industry?

Financial institutions in South Africa have and are still investing in SST channels and facilities without any definitive confirmation that this investment will provide an improvement in their organisation's performance. As a result of this phenomenon, the primary objective of this study was to understand the impact that the investment in SST has on the organisational performance in the South African financial services industry

Considering that organisations have invested in SSTs, the literature highlights that there are global and evolutionary findings that highlight factors and issues that industry is experiencing such as the uncertainty around the positioning or role of the branch network in the current financial services industry, the societal issues toward SST channels, technological interoperability and the like. Beside these issues, there were organisational expectations outlined that deduced that organisations were in position to benefit from the successful SST strategies in areas such as Scandinavia and some sections of Europe.

The findings of this research project reflects that there is a positive impact on organisational performance and is outlined as follows:

- The investment in the SST channel contributed positively to the improved or increase profitability of an organisation as it provided the platform for future revenue, proved to be cheaper channel to conduct business while still considered to be a channel that's in its infancy form a product life cycle perspective. It was conclusively agreed by all respondents that the SST channel will have positive impact on the 'jaws' or profit margins as it was designed to increase revenue while reducing overhead costs.
- Productivity would also be positively impacted by the investment in the SST channels by increasing the throughput of financial transactions through efficiencies gained via self-service, a shift from physical to virtual servicing that allow high concurrency of users without time consuming human interactions.

- Cost efficiency within the organisation improved as a result of the investment in SST which causes a reduction in the cost to serve, the reduction in unit costs as well cost efficiencies realised through the evolution of straight through processing. All respondents agreed that costs will be reduced primarily as result of conducting large amounts of transactions on a fixed cost platform.
- Finally, the investment in SST channels will improve the intangible benefits of an organisation as users and clients will experience convenience and allow for preferred interactive channel while increasing adoption and retention rates.

In conclusion, there is enough evidence highlighted in the findings above to support the position that investment in SST does have a positive impact on organisational performance of the organisation being researched in this study.

5.2. The research sub-questions to support the study

RQ2 – What are the drivers^c of a SST investments strategy?

DeLone and McLean (2003) iterated that it is important to understand the management behavioural aspects as well as the quantum of investment in systems when attempting to measure success of that system. Therefore from a system investment perspective, it would be prudent to understand what drives investment decision making by management within an organisation.

The research identified four thematic strategic drivers, namely business or operational, financial, technological and organisational or corporate strategies that influenced the organisation's decision making reasoning to invest in SST. These findings were highlighted as follows:

- The expected factors influencing the operational or business strategies of an organisation such as the shift in global banking trends, the convenience factor and the movement from physical channels would provide input into the SST investment strategy. These factors are impacted by the presence or continued improvement of SST facilities.
- Financial imperatives such as client focussed business strategies and cost reduction initiatives, clearly emphasize the need for strategic financial drivers when making investment decisions around SST strategies. The key factor to consider is that financial drivers must not be considered in isolation or the solitary reason for investing in SSTs

^c A driver, for the purposes of this study, may be considered a critical factor that determines the success of an organisation.

although it may be easier to follow that path as it may only be satisfying the organisation's short term financial benefits

- Technology plays an important role when organisations are making decision regarding an SST investment strategy while factors such as the evolution of smartphone technology, adaptability of SST facilities are taken into consideration, there is a viewpoint that technology will always be an important component of a SST investment strategy.
- The fundamental aspect of organisational or corporate strategy is to build the required platform with enough integration opportunities. Once the infrastructure was delivered, management would be in a position to make the necessary strategic decisions for an investment strategy in SST including an integrated corporate focus that will provide continuous value.

Considering the above, the findings suggest that when envisioning an SST strategy organisation have a strategic intent and motivation to invest in this channel with the expectation of benefit on various fronts.

RQ3 – What is the nature of the causal relationship between SST investment and organisational performance?

The relationship dynamics for the purposes of this study focuses on two aspects, namely the three specific 'pairwise' relationships raised in Petter et al. (2008) research as well as the causality between the two previously examined constructs.

The nature of the relationship between the primary constructs within the SST industry provided the following findings that contributed to the outcomes or objectives of this research project:

- From a 'pairwise' relationship perspective the findings provided a conclusive viewpoint regarding the three specific 'pairwise' relationships that Petter et al. (2008) had listed as lacking in evidence. Two of the three system quality constructs were unequivocally confirmed as having strong relationships to the net benefits of an organisation by the majority of respondents while the third, namely system quality was considered having a strong to moderate relationship with net benefits. Therefore system quality may not conclusively have an impact, both positive nor negative, on organisational performance. In an SST context, these findings were confirmed to be in alignments as well.
- The causality and dynamics of the relationship between investment in SSTs and organisational performance highlighted various characteristics within this unit of study

and provided an insight into the industry albeit a generalisation. The findings highlighted that there was a strong relationship intensity that provided a 'cause and effect' scenario between the two respective constructs being researched.

Furthermore there was corroboration that a positive exponential growth curve is expected with the inclusion a 'hockey stick' behaviour whereby initial underperformance is followed by positive performance.

The relationship dynamics between these two constructs, for the purposes of the research project, is considered causal and positive from a SST channel perspective.

Finally, the shortfalls in the research identified in the literature review overlaps to an extent with the research objectives; however, the overall insights are depicted in Figure 23 above. The conclusions that are deduced from this study are that a clear strategy for investment in SST would be required to impact the organisation's performance. This impact would be deemed positive as it influences all the necessary benefit factors through attributes such as convenience, shift from physical branches, reduction in unit costs and so forth.

5.3. Future recommendations

The limitations encountered in this study provide opportunities for future research. These opportunities may present themselves in a more holistic manner with the inclusion of other stakeholders such as clients or internal staff input. In addition to the client and staff input, the possibility of opening up the study to other organisations within the South African financial service industry.

The overall recommendation would therefore be to conduct a holistic study that may possibly include a wider range of stakeholders and a larger cross section of organisations in order to improve the basis for generalisation.

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Appendix A – Interview Protocol

The interviews are based on the interrelated components of the DeLoan and McLean model of IS success (2003) in order to determine the relationship between the investment in SST and the impact on organisational performance.

1. Investment in SST's

1.1. Capital Investment

- 1.1.1. Does the organisation have investment strategy for SST?
- 1.1.2. If there is a strategy, please describe the strategy?
- 1.1.3. What are the motives for implementing a SST strategy?
- 1.1.4. What percentage of technology budget is apportioned to SST investment?
- 1.1.5. Would this investment percentage change in the future?
- 1.1.6. If there is a change, please describe for what reason?
- 1.1.7. What proportion of an IT budget would be optimal to allocate to SST's considering where the industry is heading?

1.2. Quality

- 1.2.1. Does SST information quality, for example accurate reporting on transactions, contribute to organisational performance? If yes, then what is the strength of relationship?
- 1.2.2. Does SST system quality, for example ease-of-use, contribute to organisational performance? If yes, then what is the strength of relationship?
- 1.2.3. Does SST service quality, for example reliability, responsiveness, communication, access etc., contribute to organisational performance? If yes, then what is the strength of the relationship?

2. Organisational Performance

2.1. Profitability

- 2.1.1. Has SST's contributed to an increase or decrease in the organisation's profitability?
- 2.1.2. If yes, what would the reason be for this increase or decrease?
- 2.1.3. What percentage did SST contributed to the increase or decrease in profitability?
- 2.1.4. What is the expected contribution of SST to the percentage profitability in the future?

2.2. Productivity

- 2.2.1. Has SST's contributed to an increase or decrease in the organisation's productivity?
- 2.2.2. If yes, how did SST increase or decrease productivity?

- 2.2.3. What percentage did SST contributed to the increase or decrease in productivity?
- 2.2.4. What is the expected contribution of SST to the percentage productivity in the future?

2.3. Cost Efficiency

- 2.3.1. Has SST's contributed to an improvement or regression in the organisation's cost efficiency?
- 2.3.2. If yes, what would the reason be for this improvement or regression in cost efficiency?
- 2.3.3. What percentage did SST contributed to the improvement or regression in the cost efficiency?
- 2.3.4. What is the expected contribution of SST to the improvement cost efficiency in the future?
- 2.3.5. What SST facility contributed the most to cost efficiency?

2.4. Intangible benefits

- 2.4.1. Has SST's contributed to an improvement or regression in the organisation's provision of customer services?
- 2.4.2. If yes, what would the reason be for this improvement or regression in the provision of customer services?
- 2.4.3. What percentage did SST contributed to the improvement or regression in the provision of customer services?
- 2.4.4. What is the expected contribution of SST to the improvement cost efficiency in the future?
- 2.4.5. What SST facility contributed the most to the provision of customer services?

Appendix B – Interview Consent Form



Department of Information Systems

Leslie Commerce Building
Engineering Mall, Upper Campus

OR

Private Bag. Rondebosch 7701
Tel: +27 (0) 21 650 4028 Fax: +27 (0) 21650 2280
Internet: <http://www.commerce.uct.ac.za/informationssystem/>

01 July 2016

Dear Sir/Madam,

I am currently conducting research for a part-time Masters programme at the Department of Information Systems at the University of Cape Town and would appreciate your participation in order to complete the study.

The objective of this study is to gain a deeper understanding of the impact that self-service technology (SST) has on organisational performance in the South African financial services industry.

Your participation in this study will be considered voluntary with all the feedback and responses solicited from participants being used solely for the study and treated as confidential. The final research study will be presented to the University of Cape Town for academic purposes only with full anonymity guaranteed. A copy of this research will be made available to all participants.

If you are prepared to participate, I would appreciate your consent by signing the attached consent form.

Thanking you in anticipation of your assistance.

Yours sincerely,

A handwritten signature in blue ink, appearing to read 'Sumarie Roodt'.

Gerald Leak

Honours Student
Department of Information Systems
University of Cape Town

Email: Gerald.leak@gmail.com

Sumarie Roodt

Research Supervisor
Department of Information Systems
University of Cape Town

Email: sumarie.roodt@uct.ac.za

“Our Mission is to be an outstanding teaching and research university, educating for life and addressing the challenges facing our society.”

Participant Consent Form

I, _____, consent to participate and be interviewed for the purpose of this research study.

I am aware that participation is voluntary and that I may choose to withdraw from this study at any time if I so wish.

Signature

Date

Appendix C – Organisational Approval



1 June 2016

Dear Sir/Madam,

This letter serves to confirm that Gerald Leak (student no. LKXGER002) has been granted permission to conduct his research within Nedbank Limited as part completion of a Master of Commerce degree in Information Systems at the University of Cape Town.

The objective of this study is to gain a deeper understanding of the impact that self-service technology (SST) has on organisational performance in the South African financial services industry.

The research may only be conducted under the following conditions:

- Nedbank Limited and/or any of its subsidiaries are not disclosed in the research in any form,
- All individual participation in the interview process is considered voluntary,
- All individual participants being interviewed have provided written formal consent before the interview,
- The identity of all participants being interviewed will not be disclosed in any form and anonymity must be guaranteed,
- A copy of the final report must be made available to Nedbank Limited if requested,
- The Department of Information Systems at the University of Cape Town's Ethics Committee will ensure that the report, if published, will include the conditions set out above.

I trust that above is sufficient.

Yours sincerely,




Catherine Sevenoaks
Chief Operating Officer: Asset Management

Nedgroup Investments Proprietary Limited (Company registration number 1005901767007)
Incorporating Nedgroup Collective Investments (RF) Proprietary Limited (Company registration number 1001501000007)
Nedgroup Investment Advisors Proprietary Limited (Company registration number 10001733100) an authorized Financial Services Provider (FSP
licence number 1002)
Sponsor of the Nedgroup Investments Retirement Funds


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www.nedgroupinvestments.co.za

Directors: D Macleody RA, Andrew CE Sevenoaks

Appendix D – Ethics Approval

 Re: Reminder Ethics Application - Message (HTML)  

FILE MESSAGE McAfee E-mail Scan

 Fri 26/08/2016 11:34 AM
Ulrike Rivett <ulrike.rivett@uct.ac.za>
Re: Reminder Ethics Application

To Leak, G. (Gerald)

Cc Samantha Alexander

Dear Gerald
your application has been approved. You should receive an automated email or you can check on the system.
Kind regards
Ulrike Rivett

Prof Ulrike Rivett, PhD | +27216504213 |



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