FACTORS AFFECTING INFORMATION TECHNOLOGY IMPLEMENTATION IN THE MOBILE TELECOMMUNICATIONS INDUSTRY: A FAMILY BUSINESS CASE.

BY

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24 May 2010

TO WHOM IT MAY CONCERN

RE: Confidentiality Clause

This work reveals insight into strategic, financial and operational workings of the participating case-study company.

The company has requested that the content of this research paper remain confidential and not be circulated for a period of three years.

The company also requested that the company name and individuals’ names to be disguised. Consequently the company will be referenced as Company D. Relevant employees referred to in the text will be referenced by their title and first name initial.

Sincerely,

P. De Jong
DECLARATION

I, Piet De Jong, hereby declare that this research thesis is my own original work, that all reference sources have been accurately reported and acknowledged, and that this document has not previously, in its entirety or in part, been submitted to any University in order to obtain an academic qualification.

P. De Jong

31 August 2010
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ABSTRACT

This treatise investigates how information technology (I.T.) enables growth in a family business (the firm) in Port Elizabeth. The firm operates in the mobile telecommunications sector.

The objective of the study is to gain a deeper understanding on why family businesses adopt information technology in their firm by means of a case study. The firm found its technology (or lack thereof) completely out-dated compared to the competition and customer demands. The future of the firm was in jeopardy.

The study starts with a literature review of the following three topics which form part of the scope of the research:

1. Family businesses;
2. Influence of I.T. as a driver of growth in business; and
3. An introduction into the mobile telecommunications industry.

Data are collected through structured interviews with family members involved in the business. The data are consequently linked to the theory and provides insight as to what the drivers are for I.T. adoption and the required core competencies or critical success factors of the firm.

Although it might seem trivial for a small family business to adopt information technology, the research concludes that I.T. is critical for continuous growth and survival of this family business. Conversely due to a lack of internal skills the firm is heavily reliant upon outside consultants for advice, implementation and support.
Recommendations which are of particular interest to family businesses in a similar environment are:

- Embrace technology early, utilise I.T. solutions to grow and enhance current competitive advantage, do not see I.T. as a competitive advantage alone (Pavlou & Sawy, 2006);
- If information expertise is not present within the company it is advisable to invest in that expertise through recruitment, training, partnership, or outsourcing;
- Ensure software meets specification / is effective enough – this can be achieved by frequent releases cycles with small changes instead of infrequent release cycles with many big changes;
- Engage the consultants in a partnership by i.e. providing a profit share – this will ensure that the consultants are committed to the cause and will also ensure that their involvement is also in their own best interest;
- Choose local consultants who are easily accessible – build relationships and focus on trust;
- Create lock-in (Amit & Zott, 2001), provide tools free-of-charge for customers, this will make switching to competitor more difficult;
- Automate as much as possible, enable standard work practices, routinize;
- Be ready to adjust the organisational structure or relinquish control (Bruquea & Moyanob, 2007).
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GLOSSARY

ARPU

Average Revenue Per User: one of the performance indicators in running a business. This is the measurement, usually in a currency unit, that shows how much money each user spends to consume one or more products or services. Total ARPU is calculated by dividing the average monthly recurring revenue by the average monthly total reported customers during the period.

EDGE

Enhanced Data rates for GSM Evolution (EDGE) is a backward-compatible digital mobile phone technology that allows improved data transmission rates, as an extension on top of standard GSM. EDGE is considered a 3G radio technology. EDGE was deployed on GSM networks beginning in 2003. EDGE is an upgrade that provides more than three-fold increases in both the capacity and performance of GSM/GPRS networks. It does this by introducing sophisticated methods of coding and transmitting data, delivering higher bit-rates per radio channel.

GPRS

General packet radio service (GPRS) is a packet oriented mobile data service available to users of the 2G cellular communication systems global system for mobile
communications (GSM), as well as in the 3G systems. The maximum speed of a GPRS connection offered in 2003 was similar to a modem connection in an analogue wire telephone network, about 32-40 Kbit/s, depending on the phone used. GPRS is typically prioritised lower than speech, and thus the quality of connection varies greatly.

MOU

Minutes of Use: This measurement is often used in telecommunication industries or other industries in which the product/service consumption is due to time unit (time based pricing) such as: telecommunications companies, electric/power companies, gas companies. The value of MOU can be used as one of the performance indicators in some businesses.

USSD

Unstructured Supplementary Service Data is a capability of all GSM phones. It is generally associated with real-time or instant messaging type phone services. There is no store-and-forward capability, such as is typical of other short-message. Response times for interactive USSD-based services are generally quicker than those used for SMS.
1.1. AIM OF THE RESEARCH

With advances in information technology, companies race to seize opportunities and build the resource strengths and business capabilities to compete successfully in the industries and product markets of the future (Doz & Hamel, 1998).

Although scholars have provided significant research in the adoption of information technology by firms in general and in particular small businesses, very little is known about the adoption and use of information technology in family business, the impact of information technology on growth (Ogbonna & Harris, 2005) and the required key competencies of the firm. For example, some small businesses invested heavily in I.T. in the hope of fantastic rewards, whilst others have developed a Web presence to be fashionable (Levenburg & Magal, 2005).

Small firms are less likely to have in-house I.T. professionals to advise and assist business managers, which serves as a deterrent to adopt I.T. solutions (Vlosky & Smith, 2003). The majority of smaller firms are family-owned, which are often characterised as conservative and risk-averse (Donckels & Frohlich, 1991). Venturing into e-business may simply represent a greater risk than they are accustomed to taking (Levenburg & Magal, 2005). In SME’s decision-making is centralised in a reduced number of persons, standard procedures are not well laid out, there is limited long term planning and there is greater dependence on external expertise and service for information systems (Premkumar, 2003).
SME’s also face difficulties in recruiting and retaining internal I.T. professionals due to the scarcity of qualified information systems experts and the limited career advancement prospects in SME’s (Cragg & King, 1993).

Analysis has identified several organisational factors associated with information technology and adoption, such as management’s direct support for technology adoption (Damanpour, 1991), the existence of technology leaders who support the technological change (Sharma & Rai, 2003), the level of technological education in the technical departments (Premkumar, Ramamurthy, & Nilakanta, 1994), the chosen strategy (proactive / reactive ) (Teo & Pian, 2004) and the level of integration of I.T. in the business strategy (Fletcher & Wright, 1995).

1.2. PROBLEM STATEMENT
The primary objective of this research proposal is to uncover the influence of technology as a driver of growth in a high-tech family owned business, in Port Elizabeth, South Africa.

1.3. RESEARCH QUESTIONS
Since this is an exploratory study, the focus is primarily on relationships. Research questions are:

- How does the family business orientation of the firm influence motivations to adopt I.T. solutions?
1.4. RESEARCH DESIGN AND METHODOLOGY

The research method for this study is based on explorative research. Existing research on family business and I.T. adoption by the firm will form a theoretical base. From this base two questionnaires are formed to guide the interviews. The first questionnaire links the theory of family business to the case study company. The second questionnaire focuses on the I.T. adoption of the case study company.

The chosen methodology will be discussed in more detail in chapter five.

1.5. OUTLINE OF THE STUDY

Chapter One:

Introduction, problem statement, and method of study.

Chapter Two:

Literature review on family business. Family business definitions and family business models are analysed to inter alia identify the components and dynamics of a family business.

Chapter Three:
Discusses the relevance of information technology as a growth-driver in business by means of a literature review. The most important constraints for growth are listed, as well as the goals for implementing I.T. for medium sized companies.

**Chapter Four:**

Provides a brief overview of the history and a description of the most important components in the cellular industry in the context of the case study company.

**Chapter Five:**

Research design and methodology chapter. The chapter supports the qualitative method, providing evidence. It also discusses the case-study as the appropriate tool for data collection. It concludes with a description of data reliability, triangulation and integrity.

**Chapter Six:**

Chapter six provides a brief historical overview of the company, its product and service offerings and appointments of key people. The second half provides the answers to the questionnaires.

**Chapter Seven:**

In chapter seven opinions and conclusions are provided based on the findings regarding the implementation and execution of I.T. adoption within the firm to provide an answer on the research questions. Based on the findings
and opinions, the chapter provides recommendations for other family businesses in a similar environment.

1.6. LIMITATIONS OF THE STUDY
The study is limited to a single company in Port Elizabeth, South Africa. Relevant information on family business and I.T. adoption was sufficiently available in peer reviewed journals.

1.7. CONCLUSION
Chapter one introduced the problem statement. Chapter two will provide review on a literature study on family business models.
CHAPTER TWO
FAMILY BUSINESS

2.1. INTRODUCTION
The concept of family business seems very easy to understand, but can be interpreted in several ways. As the two words reveal, the family business concept includes two separate, but overlapping entities: the family and the business. This chapter researches the definitions and dynamics of a family business.

2.2. DEFINITIONS OF FAMILY BUSINESS
It still remains difficult to accurately define an operational definition of what constitutes a family business (Ibrahim, Angelidis & Parsa, 2008) which is evident by the plethora of definitions:

- A family business is one in which two or more family members work (Beehr, Drexler & Faulkner, 1997);
- Any business in which majority ownership or control lies within a single family (Rosenblatt, Anderson & De Mik, 1985);
- A family firm is an enterprise that, in practice, is controlled by the members of a single family (Barry, 1989); and
- The classification of a family firm as “family” or “nonfamily” should be left to the judgement of the person who manages the business (Westhead, 1997).

More recent definitions are more refined:

- A family business can be defined as one that is ownership controlled by a single family and where two or more family
members significantly influence the direction of the business through their ownership rights, management roles or family ties (Davis, 2007); and

• A family business is one that has been started by a founder and is owner managed which then results in more than one family member working in the business. The business is expected to be passed on to succeeding generations of the family, sometimes through marriage, which leads to sibling partnerships and eventually family syndicates where the descendants of the original founder own or control or participate in and/or benefit from the business (Cullen, 2005).

For the purpose of this case study the definition from Ogbonna and Harris (2005) will be used:

• A family firm is defined as a business in which more than fifty per cent of the shares are owned by a single family that is involved in the management of the business and where there is an intention of transferring the business from one generation of this family to another.

2.3. IMPORTANCE OF FAMILY BUSINESSES

Family businesses world-wide are contributing increasingly to the economic activity in their respective countries. An overview is presented in Table 2-1:
### Table 2-1 Family business contribution to GNP

<table>
<thead>
<tr>
<th>Country</th>
<th>% of Family Business</th>
<th>GNP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>75%</td>
<td>50%</td>
</tr>
<tr>
<td>Belgium</td>
<td>70%</td>
<td>55%</td>
</tr>
<tr>
<td>Brazil</td>
<td>90%</td>
<td>63%</td>
</tr>
<tr>
<td>Chile</td>
<td>75%</td>
<td>50%-70%</td>
</tr>
<tr>
<td>Finland</td>
<td>80%</td>
<td>40%-45%</td>
</tr>
<tr>
<td>France</td>
<td>&gt;60%</td>
<td>&gt;60%</td>
</tr>
<tr>
<td>Germany</td>
<td>60%</td>
<td>55%</td>
</tr>
<tr>
<td>Italy</td>
<td>93%</td>
<td></td>
</tr>
<tr>
<td>Netherlands</td>
<td>74%</td>
<td>54%</td>
</tr>
<tr>
<td>Poland</td>
<td>Up to 80%</td>
<td>35%</td>
</tr>
<tr>
<td>Portugal</td>
<td>70%</td>
<td>60%</td>
</tr>
<tr>
<td>Spain</td>
<td>79%</td>
<td></td>
</tr>
<tr>
<td>UK</td>
<td>70%</td>
<td></td>
</tr>
<tr>
<td>USA</td>
<td>96%</td>
<td>40%</td>
</tr>
</tbody>
</table>

Source: Adopted from Timmons and Spinelli (2009)

In South Africa it is estimated that more than eighty percent of all businesses have family ownership involvement and more than sixty percent of all listed companies in South Africa comprises family involvement at least during its start-up (Venter, 2002).

Family businesses have particular attributes that provide certain competitive advantages; they are nimbler, more customer-orientated and quality focused and more active in the community. As a result family firms tend to outperform non-family firms (Ibrahim, Angelidis & Parsa, 2008).

They (family businesses) not only make a significant contribution to the economic progress in their societies but also have a profound impact on social progress (Ogbonna & Harris, 2005).
Family businesses have been the mainstay of many economies. They not only have been the major producers of goods and services in most countries, but they also have provided the drive for expanded supplies of goods and services. They have driven the gross national product in many countries (Wortman, 2004).

2.4. UNDERSTANDING FAMILY BUSINESS DYNAMICS

Uncovering the components of a family business will provide insight as to how a family business interacts. These components together are referred to as the family business – system.

Tagiuri and Davis (1982) developed a three-circle model to represent the interactions that occur within family businesses. The three-circle model describes the family business system as three independent but overlapping subsystems: business, ownership and family. Any individual in a family business can be placed in one of the seven sectors that are formed by the overlapping circles of the subsystems. The model is depicted in Figure 2-1.

Figure 2-1 Family business system
Source: Adopted from Tagiuri and Davis (1982)

Carlock and Ward (2001) depict the family business as a scale which should be balanced between business requirements and opportunities and the family needs and wants, see Figure 2-2.

Figure 2-2 Family business scale

Source: Adopted from Carlock and Ward (2001)

The balance according to Carlock and Ward is achieved by pivoting five potential variables:

- Control: Establish in a fair way who will make decisions;
- Careers: Make it possible for family members to pursue rewarding careers with advancement and rewards based on performance;
- Capital: family members can re-invest or dis-invest without damage to other family members' interests;
- Conflict: address conflict due to closeness between work and family; and
- Culture: use family values in developing plans and actions.
Further research by Ward (2004) also states that families and business are themselves a study in contrasts as highlighted in Table 2-2.

Table 2-2 Family business contrasts

<table>
<thead>
<tr>
<th>Family</th>
<th>Business</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emotional</td>
<td>Rational and objective</td>
</tr>
<tr>
<td>Basically socialistic</td>
<td>Basically capitalistic</td>
</tr>
<tr>
<td>Membership is permanent</td>
<td>Membership is voluntary and discretionary</td>
</tr>
</tbody>
</table>


Ward (2004) developed a model, called the 4 P’s to reduce or avert the friction from the inherent contrasts which will be elaborated on in detail:

- Policies;
- Purpose;
- Process; and
- Parenting.

A policy is a definite course or method of action selected from among alternatives and in light of given conditions to guide and determine present and future decisions (Merriam Webster, 2010).

Ward (2004) highlights two advantages of implementing policies before the need:

1. Issues are given attention before they become emotional or personal; and
2. Family is managing expectation, preparing family members for how things will work.
The second component of Ward’s model is purpose. Many people desire less tangible, subjective outcomes such as work-life balance as well as a sense of meaning, purpose and contribution from their work (Heslin, 2005). Especially in a family business a compelling and inspiring purpose enables a family business to face the inherent contradictions of being in business together – it enables family members to feel they are involved in something much larger and more significant than their individual selves (Ward, 2004).

The third component is process. Raghu and Vince (2007) define a process as an operational context for knowledge and its application. Merriam-Webster (2010) has the following definition for process:

“A series of actions or operations conducing to an end; especially: a continuous operation or treatment especially in manufacture”.

Ward’s (2004) interpretation of process in the family business context is scheduling of regular meetings, debating issues concerning them and voicing their (family members) opinions – the process of developing, policies and to share expectations.

The final component is parenting. Parenting is to raise a child – or to take care of someone in the form of a parent. Parents in most successful family firms keep their attention on parenting (Ward, 2004).

The right balance between family and business is depicted in Figure 2-3. A balanced system creates trust, commitment, business
effectiveness and harmony. The balanced approach becomes the foundation for healthy family business relationships (Carlock & Ward, 2001). Family influence can become a blessing or a curse for a company (Avendano-Alcaraz, Kelly, Trevinyo-Rodríguez & Gómez, 2009).

Figure 2-3 Balanced business and family system

Source: Hubler & Ayres (1996)

An overemphasis on business erodes family communication, family identification, family locality, and family time and emotions – as depicted in Figure 2-4

Figure 2-4 Off-balance: business first

Source: Hubler & Ayres (1996)
Overemphasis on the family erodes business communications, business relations, performance appraisals, decision making and strategic options – as depicted in Figure 2-5.

Figure 2-5 Off-Balance: Family First

Source: Hubler & Ayres (1996)

An example of the correct balance in a given situation is provided by Ward (2004):

“...family business owner put on his managerial hat and fired an underperforming and frequently tardy son; but he put on his family hat on afterwards and said: ‘I heard you lost your job, is there anything I can do to help?’

Ward (2004) states that family members typically list the following benefits and disadvantages of owning a business together (Table 2-3):

**Table 2-3 Benefits and disadvantages of owning a family business**

<table>
<thead>
<tr>
<th>Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Opportunity to work together</td>
</tr>
<tr>
<td>Our mutual trust strengthens the family and the business</td>
</tr>
<tr>
<td>Opportunity to create wealth</td>
</tr>
<tr>
<td>Offers a means to pass values on to our children</td>
</tr>
<tr>
<td>Earns us respect in the community</td>
</tr>
<tr>
<td>Gives us a greater influence than we would have as individuals</td>
</tr>
</tbody>
</table>
### Disadvantages

<table>
<thead>
<tr>
<th>Potential for conflict</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potential for disappointment when personal goals are not realised</td>
</tr>
<tr>
<td>(i.e. getting a promotion or having one's ideas accepted)</td>
</tr>
<tr>
<td>Too many financial eggs in one basket - the business</td>
</tr>
<tr>
<td>Loss of privacy resulting from greater visibility in the community</td>
</tr>
<tr>
<td>Vulnerability to criticism from outside the family</td>
</tr>
</tbody>
</table>

Source: Ward, 2004

Ginebra (1999) as quoted in Avendano-Alcaraz et al (2009) lists the following strengths:

- comprehension;
- acceptance of authority;
- common goals;
- dedication;
- flexibility; and
- agility in deciding and implementing.

and the following weaknesses:

- nepotism;
- autocracy;
- difficulty in delegation;
- paternalism;
- confusion in cash flows;
- manipulation by family members; and
- lack of definition of organizational structure.

James and Kaye (1999) state three advantages that family businesses incorporate:
1) implicit contractual relationships among family members pre-exist business involvement, and many of them result in agency costs which are relatively lower than formal, explicit relationships;
2) competitive advantage follows when the horizons of decision makers are broadened due to commitment to the long term support of the family; and
3) firm value is enhanced due to the access to family resources, especially when access to other capital is limited.

2.5. FAMILY BUSINESS FRAMEWORKS
Several theoretical frameworks have been developed. Sharma (2002) has proposed a typology that identifies seventy-two distinct non-overlapping categories of family firms according to the extent of family involvement in terms of ownership and management. This classification still needs to be subjected to further empirical tests to identify family firms prevailing in each nation at any point in time (Sharma, 2006).

Other major and somewhat more recent frameworks are (Heck, Hoy, Poutziouris, Steier & Lloyd, 2008):

1. The bulls eye model of an open-system approach (Pieper & Klein, 2007);
2. Family embedded-ness perspective (FEP) (Aldrich & Cliff, 2003);
3. Resource-based framework (Habbershon & Williams, 1999);
4. Sustainable family business theory model (SFBT model) (Danes, Lee, Stafford & Heck, 2008);
5. Theory of agency and altruism in family firms (TAA) (Schulze, Lubatkin & Dino, 2003); and


The details of each framework are discussed in detail in their respective articles, as cited previously.

Research has also revealed that the national fiscal laws (i.e. inheritance and capital gains tax) influence the type of family business that prevails in a country, as firm leaders attempt to minimize tax payment and retain earnings within their family and business (Burkart, Panunzi & Shleifer, 2003).

Astrachan, Klein and Smyrnio (2002) have presented a validated ready-to-use scale for assessing the extent of family influence on any business organisation, see Figure 2-6. This continuous scale is comprised of three subscales: power, experience and culture (F-PEC scale)

- **Power**: articulates the interchangeable and additive influence of family power through ownership, management and/or governance;
- **Experience**: measures the breadth and depth of dedication of family members to the business through the number of individuals and generation of family members involved in the business; and
- **Culture**: Commitment to the business and values
The F-PEC Scale enjoys the rare capability to determine degrees of "familiness" in a given firm, rather than using a dichotomous categorisation that has been criticised by family business researchers (Rutherford, Kuratko & Holt, 2008).

2.6. EXTERNAL CONSULTANTS AND THE FAMILY BUSINESS
Professional advisers and consultants offer an extra dimension of competence, experience and objectivity to issues affecting the family business. They can also contribute significantly to the professionalism and growth potential of the family business (Leach, 2007). Advisors provide an external, neutral look at situations and help reflect on possible resolutions. They also bring objectivity to the process and help serve as sounding boards, facilitators or mediators when necessary (Kenyon-Rouvinez & Ward, 2005).
Both family and non-family businesses realize that they lack the expertise to address some of their problems (Cater & Schwab, 2008). Although firms tend to be very knowledgeable about their current operations, they often lack the required broader knowledge and competences to initiate and guide organisational changes (Finklin, 1985). One way to gain swift access to needed expertise is by drawing on external sources, such as external appointments or management consultants (Aronoff, Astrachan & Ward, 1996; Leach, 2007). These external sources of expertise may either provide needed knowledge and experience directly or support organisational learning processes (Hargadon & Sutton, 1997).

Kenyon-Rouvinez and Ward (2005) recommend that family businesses should pay attention to the following three aspects when choosing advisors or external consultants:

- Level of expertise and experience;
- Absence of conflict of interest; and
- Mutual appreciation and trust.

2.7. ADOPTION OF I.T. IN FAMILY BUSINESSES

Literature review has identified the following characteristics of family businesses in the I.T. sector:

- They operate in small geographic areas (Levenburg & Magal, 2005);
- They often venture in the e-business blindly of with little guidance (Auger & Gallaugher, 1997; Thong, 1999; Zank & Vokurka, Spring 2003);
• Are less likely to have in-house professionals which serves as a deterrent to adopt I.T. (Vlosky & Smith, 2003);
• Owner characteristics largely determines the choice of going online (Weltevreden & Boschma, 2008);
• Smaller firms will not go online unless they see benefits (Pratt, 2002 as quoted in Levenburg & Magal 2005); and
• Family owned business are often characterised as risk-averse and conservative (Donckels & Frohlich, 1991);

Owner characteristics play an important role for example in ethnic background and computing/Internet skills (Weltevreden & Boschma, 2008).

Foley and Ram (2002) found that ethnic small businesses in the UK have less access to the Internet and also have a lower propensity to develop a Web site, compared to non-ethnic small businesses. According to Allinson, Braidford, Grewer, Houston, Orange and Sear (2004), most ethnic minority business owners have limited personal knowledge of I.T.

Thong and Yap (1995) found that small businesses with innovative CEOs, who are knowledgeable about I.T. and have a positive attitude towards I.T. adoption, are most likely to adopt the Internet.

Conversely the level of education does not impact I.T. adoption (MacGregor & Vrazalic, 2007), nor does age or gender make a noticeable difference (Weltevreden & Boschma, 2008).

Lefebvre and Lefebvre (1992) state that the number of years a CEO is working in the sector negatively influences the innovativeness of
a small business. This can be explained by the fact that “a longer tenure in a particular sector would correspond to more habit formation, greater reluctance to alter established policies, and thus less likelihood to activate changes of a more radical nature” (Lefebvre & Lefebvre, 1992).

Puiga and Peréz (2009) state that the potential of family firms to compete in the global economy is limited because of their difficulty in growing big enough to take advantage of technology and economies of scale and also because of their reluctance to accept outsiders in management or ownership.

Inhibiting factors of the adoption and implementation of I.T. are the modification of the firm's hierarchy and power structures, as well as the absence of qualified personnel (Bruquea & Moyanob, 2007).

2.8. CONCLUSION

Different models have been analysed to gain an understanding of the components and dynamics of family business through a literature study. A brief overview of the use of external consultants to aid family businesses has been provided and the chapter exposed some of the characteristics of family businesses and small businesses adopting information technology.

Chapter three will provide an overview of the influence of I.T. as a driver of growth in business.
CHAPTER THREE
THE INFLUENCE OF I.T. AS A DRIVER OF GROWTH IN BUSINESS

3.1. INTRODUCTION
Schumpeter (1934) pioneered the theory of economic development and new value creation through the process of technological change and innovation. He viewed technological development as discontinuous change and disequilibrium resulting from innovation. Schumpeter identified several sources of innovation (hence, value creation and growth) including the introduction of new goods or new production methods, the creation of new markets, the discovery of new supply sources, and the reorganisation of industries.

Technology is the application of science especially to industrial or commercial objectives (American Heritage Dictionary, 2009).

Growth can be defined as progressive development (Merriam Webster, 2010). A growth company is a company that grows at a greater rate than the economy as a whole and that usually directs a relatively high proportion of income back into the business (Merriam Webster, 2010).

Investment in I.T. is loosely defined as including computers and telecommunications equipment and their necessary hardware, software, and services (Dedrick, Gurbaxani & Kraemer, 2003). Firms regularly invest in I.T. for such activities as payroll, human resources, accounting, supply chain management, and a host of other functions (Rao, Metts & Monge, 2003). While smaller firms have been more reluctant to invest heavily in I.T., larger firms have
found it almost imperative and profitable (Stimmel, 2001). Of particular concern to smaller firms is the resource requirements associated with I.T. investment (Pool, Parnell, Spillan, Carraher & Lester, 2006). By using I.T. to automate business processes and to improve information gathering, access, and quality, small firms can transform their entire business (Dedrick et al, 2003).

For SMEs, four factors found to have a profound influence on I.T. investments are (Grandon & Pearson, 2004; Mehrtens, Cragg & Mills, 2001):

1. the perceived cost savings and income generation benefits;
2. external pressure from rivals, suppliers, and buyers;
3. organisational readiness; and
4. perceived ease of use.

I.T. investment in SMEs differs from I.T. investment in large firms because a smaller number of people have decision-making responsibility, standard procedures are not instituted, long-term planning is limited, and there is more reliance on external I.T. experts in SMEs (Premkumar, 2003). Nonetheless, I.T. capabilities may enable the long term survival of SMEs in a number of ways. They provide access to external knowledge and financial resources, create trust and legitimacy through widespread information dissemination, and generate more social network ties (Morse, Fowler & Lawrence, 2007).

Cooper and Zmud (1990) argued that the I.T. adoption process could be divided into six stages as depicted in Figure 3-1.
Figure 3-1 Stages of I.T. adoption in the firm

1. initiation: active or passive search for opportunities;
2. adoption: negotiations for backing I.T. implementation;
3. adaptation: applying the I.T. and revising organisational procedures;
4. acceptance: company members are encouraged to use the I.T.;
5. routinisation: the use of the I.T. becomes standard; and
6. infusion: efficiency is increased as a consequence of the I.T. use.

Among the external factors relating to I.T. adoption researchers have found that the following are common (Del Aguila-Obra & Padilla-Meléndez, 2006):

- pressure from competitors, customers or suppliers;
- the role of government (incentives);
- partners’ alliances;
- technological infrastructure;
- technology consultants;
- image of Internet technology; and
- users’ expectations.
Investment in I.T. has different purposes, as a study by Lester and Thuhang (2008) determined:

- Firms in the conception and development stage will pursue I.T. capabilities that enable connectivity, creativity, and design activities;
- Firms in the commercialisation stage will pursue I.T. capabilities that enable flexibility, training, and communication activities;
- Firms in the growth stage will pursue I.T. capabilities that enable customer relations, market responsiveness, and marketing activities; and
- Firms in the stability stage will pursue I.T. capabilities that enable efficient production, back-office support, and collaboration activities.

Kazanjian’s (1988) study based on four life-cycle stages in technology new ventures found differences in the types of dominant problems across these stages. These stages are:

- conception and development;
- commercialisation;
- growth; and
- stability.

Lester and Thuhang link their capabilities to Kazanjian’s Life Cycle (Kazanjian, 1988) model as depicted in Table 3-1.
<table>
<thead>
<tr>
<th>Life Cycle Stage</th>
<th>Kazanjian’s Problem Factors</th>
<th>I.T. Capability Suggestions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Conception and</td>
<td>• Product development</td>
<td>• Open source collaboration;</td>
</tr>
<tr>
<td>development</td>
<td>• Resource acquisition</td>
<td>• Website</td>
</tr>
<tr>
<td></td>
<td>• Sales/Marketing</td>
<td>• Connectivity – Website</td>
</tr>
<tr>
<td>2. Commercialisation</td>
<td>• Strategic positioning</td>
<td>• E-mail</td>
</tr>
<tr>
<td></td>
<td>• Recruitment and Training</td>
<td>• Design – CAD/CAM</td>
</tr>
<tr>
<td>3. Growth</td>
<td>• Sales/Marketing</td>
<td>• Flexibility – Project planning and scheduling software; Inventory management system</td>
</tr>
<tr>
<td></td>
<td>• Internal Control</td>
<td>• Training – Online recruitment and training system</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Communication – Web-linked value chain activities</td>
</tr>
<tr>
<td>4. Stability</td>
<td>• Profitability</td>
<td>• Efficient Production – Web-linked value chain activities</td>
</tr>
<tr>
<td></td>
<td>• Internal Control</td>
<td>• Back-office support – Automation software for accounting, payroll, purchasing, travel, etc.</td>
</tr>
<tr>
<td></td>
<td>• Future growth</td>
<td>• Collaboration – Website</td>
</tr>
</tbody>
</table>

Source: Adopted from Lester and Thuhang (2008)

I.T. investments that are used only as a tool are not sufficient; instead, it must be viewed as a capability to be integrated with other core capabilities and used strategically (Kim & Jee, 2007).
3.2. SMALL BUSINESS AND GROWTH

A study conducted by The Economist (2007) found the following three distinct differences between large corporations and the SME (Small to Medium Enterprises):

- SME’s have fewer resources;
- SME’s have less market power; and
- SME’s are forced to-do more with less.

Research shows how and why SME’s are able to survive the corporates:

- Mid-sized companies tend to focus on building a strong niche rather than trying to dominate an entire sector (Jeffcoate, Chappel & Feindt, 2002 and Puiga & Pérez, 2009);
- At small to midsized companies, executives have more control (The Economist, 2007);
- Bowen (cited in McKeiver and Gadenne (2005)) “asserts that smaller firms may be more flexible, and thus able to exploit environmental niche opportunities”;
- Employees are closer to the business, which often results in more job satisfaction;
- There is less bureaucracy (Möller, Partanen & Rajala, 2007);
- Smaller groups often result in tighter personal bonds and better communication; and
- Less inertia.

Ogbonna and Harris (2005) conducted a case-study analysis of a mature family firm and concluded that the following factors
impede the adoption and use of information technology in that specific company:

- The history of the company;
- The culture of the company;
- The nature of the sector;
- Relationships with customers; and
- The tenure and age profile of the employees.

3.3. GROWTH THROUGH NEW TECHNOLOGY

Firms attempt to understand the nature of technological change and evolution to create accurate forecasts, take advantage of investment and market opportunities and maintain or grow market shares (Adomavicius, Bockstedt, Gupta & Kauffman, 2005).

Particularity in the mobile telecommunications industry, research conducted in the US by CTIA reveals the following (CTIA, 2010):

- Wireless industry directly/indirectly employ >2.4 million Americans;
- Wireless jobs paid > fifty percent higher than the national average of other production workers; and
- Estimates of productivity gains from wireless broadband services >$860 billion between 2005-2016.

The wireless industry sparks innovations creating new products and/or markets (Microsoft, 2006):

- Mobile TV;
- Unified communications;
• Apple iTunes;
• Palm, Blackberry, Smartphones; and
• Amazon Kindle, Barnes & Noble Book.

One growth strategy is to reduce cost. Research conducted by The Economist (2007) amongst 535 participants in small to medium businesses lists the following constraints in order of importance that promote or inhibit growth. A full overview is depicted in Figure 3-2.

1. Software constraints

Seventy percent of companies found software is too expensive. Sixty percent found that software applications are not effective enough. Companies focus on standardisation to improve integration between different software platforms.

2. I.T. Talent Resources

More than half of the respondents state that staff resources are not adequate to meet demand. Staff costs are also an issue – sixty percent of the respondents indicated.

3. Broadband and the cost of broadband

Particularly applicable to South Africa is the high cost of broadband Internet (Gillwald, 2009).
Source: The Economist (2007)

The top 5 goals of mid-sized companies are listed in Figure 3-3. Evident is that growth cannot be achieved through I.T. alone. I.T. is an enabler and not a source of competitive advantage. Growth requires a multi-dimensional strategy that integrates finance, operations and product development areas (The Economist, 2007).
This is confirmed by a study conducted by Amit and Zott (2001). Amit and Zott explore the theoretical foundations of value creation in e-business. Their research suggests that the value creation potential of e-businesses centres on four interdependent dimensions, namely: efficiency, complementarities, lock-in, and novelty – as depicted in Figure 3-4. Again stressing that I.T. is an enabler and not a competitive advantage.
Shih, Kreamer, and Dedrick (2007) state that the following factors influence investment levels on a country level and influence growth:

- complementary assets – such as telecommunications infrastructure;
- openness to external knowledge – exposes companies to international competition – meet requirements from suppliers etc.;
- the information intensity of the economy – both financial services and community / public service (government, education and health-care) have a highly information intensive; and
the legal and regulatory environment - Strong intellectual property (IP) protection will encourage businesses to develop and market new software, or to create custom applications for specific users. Protection for businesses and consumers engaged in e-commerce also encourages I.T. use in business transactions and online sales (Yeung & Oxley, 2001).

3.4. IT AND THE FIRMS COMPETITIVE ADVANTAGE
A literature review covering 648 articles by Piccoli and Ives (2005) found that a narrow focus on I.T. is misguided and misleading. The firms focus should be on I.T. dependent strategic initiatives of which I.T. represents a fundamental component. Technology does not contribute to firm performance in isolation, but instead contributes as part of an activity system that fosters the creation and appropriation of economic value.

Studies further indicate that I.T. adoption is predominantly arising from within the I.T. department of a company, therefore ignoring the role of business users (or clients) to strategically leverage I.T. (Pavlou & Sawy, 2006).

3.5. CONCLUSION
Growth drivers in I.T. have been identified in this chapter from several authors with an emphasis on smaller business. The following chapter will provide an overview of the mobile telecommunications industry.
CHAPTER FOUR
INTRODUCTION TO THE MOBILE INDUSTRY

4.1. INTRODUCTION

Recent years have witnessed phenomenal growth in the number of mobile-phone subscribers. Today, mobile phones vastly outnumber fixed-line phones in most countries around the world. Mobile phones offer a range of features in addition to flexibility such as phone books, diaries as well as the ability to play music, send text messages and take digital pictures (Esselaar & Stork, 2005).

4.2. WIRELESS TECHNOLOGY

4.2.1. Standards

Standardisation is required to promote interoperability between different software and/or hardware platforms and mobile devices. ETSI (2010) describes a standard as: A technical specification approved by a recognised standardisation body for repeated or continuous application, with which compliance is not compulsory and which is one of the following:

- international standard: a standard adopted by an international standardisation organisation;
- European standard: a standard adopted by a European standardisation body; and
• National standard: a standard adopted by a national standardisation body and made available to the public (ETSI, 2010).

Merriam-Webster (Merriam Webster, 2010) defines a standard as follows:

• something established by authority, custom, or general consent as a model for example : criterion;
• something set up and established by authority as a rule for the measure of quantity, weight, extent, value, or quality.

Global telecommunications standardisation is regulated by two organisations:

Standards for telecommunications are developed by the ITU (International Telecommunications Union). The ITU is a United Nations organisation for information and communication technology issues and the global focal point for governments and the private sector in developing networks and services. Its membership includes 191 Member States and more than 700 Sector Members and Associates (ITU, 2010).

A European non-profit organisation called the European Telecommunications Standards Institute (ETSI) standard was created during the forming of the European Union in early 1990 in partnership with the European manufacturing industry and customers. ETSI cooperates closely with the ITU. Their primary objective is to support the European Union and contribute to world-wide standardisation. ETSI produces globally-applicable standards for Information and Communications Technologies (ICT),
including fixed, mobile, radio, converged, broadcast and Internet technologies (ETSI, 2010).

The US focused non-profit CTIA has represented the wireless industry since 1984 and is focused on looking after and promoting wireless-consumer’s interest. Membership of the association includes wireless carriers and their suppliers, as well as providers and manufacturers of wireless data services and products. The association advocates on behalf of its members at all levels of government. CTIA also coordinates the industry’s voluntary efforts to provide consumers with a variety of choices and information regarding their wireless products and services. This includes the voluntary industry guidelines; programs that promote mobile device recycling and reusing; and wireless accessibility for individuals with disabilities. The association also operates the industry’s leading trade shows, as well as equipment testing and certification programs to ensure a high standard of quality for consumers (CTIA, 2010).

4.2.2. Technical evolution in the mobile industry

The evolution of the technology in the mobile industry is depicted in Figure 4-1. Each one of these technologies will be described in detail.

**First generation - 1G**

1G is an amalgamation of all systems prior to 2G - subsequent numbers refer to newer and upcoming technology. During this generation most countries only had one state owned operator with a low number of users. Analogue technology was employed and minimal
coordination took place between operators at a national level – which meant that systems where only designed to be deployed in a specific geographical area – not to be extended to other areas (Witthuhn, 2006). The equipment was bulky and had a limited battery life (Benn, 2004).

**Second Generation - 2G**

The first digital system and introduction of the SMS feature where subscribers can send text messages. The advantage of digital over analogue is improved security through digital encrypted traffic – eliminating eavesdropping and an improved quality of service over the existing analogue phone system (Jamalipour, 2003).

**Second Generation Enhanced - 2.5G**

Evolving and improved data capabilities were added to the existing 2G generation - employing technologies such as GPRS (General Packets Radio Service) and Enhanced Data Rates for Global Evolution (EDGE) (Witthuhn, 2006).

**Third Generation - 3G**

Third Generation mobile network standards. Besides better voice quality, 3G networks allow for faster data transfer than GPRS. 3G is often also called mobile broadband (GSM World, 2010);
The Wireless Association depicts the development of wireless technology through the means of the “Virtuous Cycle” as depicted in Figure 4-2. As better technology comes out to increase bandwidth – so do new devices and applications that consume the new available bandwidth.

Source: Adopted from (CTIA, 2010)
4.2.3. Pre-paid vs. post paid

Competition intensifies as mobile technology intensifies, especially in developed and open markets (Tallberg, 2004). In addressing market conditions, mobile service providers typically offer two forms of service:

- Pre-paid – where customers prepay an amount that reduces on actual usage; and
- Post-paid – where customers agree to a minimum fixed monthly spend and pay at month end.

Mobile firms often entice customers to become post-paid via better usage rates and mobile handset subsidies. This is because revenue from post-paid services is more assured and predictable – a particularly important factor for mobile telecommunications where network infrastructure incurs huge fixed operating cost – regardless of short-term utilisation. In return, customers commit to contracts with premature termination penalties. Pre-paid customers enjoy the flexibility of no minimum periodic spend or contractual obligation to the service provider (Lee, Murphy & Dickinger, 2003; Esselaar & Stork, 2005).

As is evident from Table 4-1 the South African market is dominated by prepaid products.

<table>
<thead>
<tr>
<th></th>
<th>Prepaid Users ‘000</th>
<th>Post Paid Users ‘000</th>
<th>ARPU Post Paid</th>
<th>ARPU Prepaid</th>
</tr>
</thead>
<tbody>
<tr>
<td>MTN</td>
<td>13.044</td>
<td>3.023</td>
<td>R 365.00</td>
<td>R 100.00</td>
</tr>
<tr>
<td>Vodacom</td>
<td>21.765</td>
<td>4.497</td>
<td>R 447.00</td>
<td>R 70.00</td>
</tr>
</tbody>
</table>

Table 4-1 Prepaid vs post-paid users

4.2.4. Methods of prepaid top-up

In general three products exist in the South African Prepaid market for topping up prepaid airtime. These products are available in many different denominations. Table 4-2 lists the most popular denominations currently available in the market.

<table>
<thead>
<tr>
<th></th>
<th>R 2.00</th>
<th>R 5.00</th>
<th>R 10.00</th>
<th>R 12.00</th>
<th>R 15.00</th>
<th>R 29.00</th>
<th>R 35.00</th>
<th>R 49.00</th>
<th>R 55.00</th>
<th>R 110.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vodacom</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MTN</td>
<td>R 5.00</td>
<td>R 10.00</td>
<td>R 15.00</td>
<td>R 30.00</td>
<td>R 60.00</td>
<td>R 180.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cell C</td>
<td>R 10.00</td>
<td>R 25.00</td>
<td>R 35.00</td>
<td>R 39.00</td>
<td>R 50.00</td>
<td>R 70.00</td>
<td>R 150.00</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Author

There are two top-up categories, namely physical and virtual top-up.

The physical top-up includes the physical distribution of vouchers from provider through dealer to vendor - whereas the virtual vouchers are distributed electronically – predominantly through the use of wireless technology.


Virtual distribution methods have several advantageous over physical distribution of stock:

- Real-time;
- No money tied up into stock;
• Less theft prone;
• Real-time sales overview;
• No stock required for vendor – just a credit balance;
• No physical voucher distribution required; no expenses such as vehicles, drivers, insurance, petrol etc.;
• No secure storage required at warehouse – use of firewalls and encryption for E.V.D. will be required;
• 24/7 continued uninterrupted sales – does not run out of stock; and
• Improved stock control – slow moving stock / fast sellers etc.

Disadvantages:

• Start-up – costs are more expensive with E.V.D. due to capital expense of terminal, average terminal unit price depending on features and functionality ranges between R1500.00 and R5500.00; and
• Required technical skills for development of software and hardware infrastructure.

A brief description of the distribution methods follows:

**Hard-cards**

These are plastic cards – a coin or finger nail can be used to scratch the material off a strip on the card and reveal the Pin. Hard cards are less popular to vend since their cost is higher to manufacture and are currently phased out.
**Paper cards**

Dual layer paper – needs to be opened by tearing off the sides. These vouchers are supplied in bulk through distribution. These cards are printed on high-speed impact printers.

**Pin less top-up**

Both Vodacom and MTN offer a service where vendors can provide pin-less top-up. This works as follows:

- A customer approaches a vendor and chooses the amount of airtime they want;
- The customer then provides the vendor with their cell phone number and payment;
- The vendor then transfers the required amount of airtime from their cell phone to the customers’ cell phone;
- An SMS is sent to the client informing them that their airtime account has been “topped-up” with the required amount of airtime.

Pin less top-up reduces the hassle of vendors having to transport or organise the collection of physical recharge vouchers. This makes them far more mobile and flexible – increasing the convenience for their customers (Louw, 2008).

**4.2.5. E.V.D. – Electronic Voucher Distribution**

Another medium for distribution of PINS and by far the most prominent and popular is through E.V.D. (Electronic Voucher Distribution). These cards are dispensed through either a self-
service terminal – or purchased from a vendor in-store. Through a wireless connection the required pin is pulled from a stock – database and printed by a predominantly thermal printer.

Leading retailers and banks such as Spar, Clicks, Pick’nPay, Shoprite, FNB and Nedbank offer the dispensing of vouchers through their point of sale systems and/or ATM machines (Blue Label Telecoms, 2008).

4.3. MOBILE ENVIRONMENT

The result of a recent study by the Bank of America into SIM penetration in developing countries is depicted in Figure 4-3.

Figure 4-3 SIM Card penetration

Source: Bank of America (2009)

>100% SIM card penetration can be attributed to for example:

- Multiple SIM’s per individual;
• Work / Personal SIM; and
• Voice / 3G Data.
• Telemetry & remote monitoring.

4.4. TELECOMS IN SA: HISTORICAL REVIEW

• Telecommunications services were until the early 1990s provided by Telkom SA as a parastatal monopoly;
• Telkom evolved through different phases, was commercialised in the early 1990s and began to assume some characteristics of a company managed along private company principles;
• Early 1990s: mobile licences were issued to Vodacom and MTN;
• A third mobile license was issued in 2001 to Cell C;
• In 2001 ICASA was formed from the broadcasting and telecommunications regulatory bodies;
• In 2005 a ministerial determination allowed VANS to provide voice services; at the time of the issue of the mobile licences, telephony penetration in SA was less than 10% and less than 5 million of SA’s 40 million subjects had access to a phone;
• Virgin Mobile and Cell C form a joint venture in December 2005; and
• 2009: telephony penetration has hit about hundred and ten percent by SIM and approximately seventy-five percent by population.
4.5. SOUTH AFRICAN GSM MARKET OPERATORS

4.5.1. Vodacom (PTY) Ltd

Vodacom was founded in 1993 and is one of two operators granted a license in South Africa. Over the last 15 years the company has established over forty million customers, of which twenty-six million are in South Africa (Vodacom, 2010).

Currently the group provides telecommunications services in South Africa, Tanzania, Democratic Republic of Congo, Lesotho and Mozambique (Vodacom, 2010).

In 2009 parastatal Telkom agreed to sell its remaining stake to Vodafone in a R22.5 billion deal (Stones, 2008).

4.5.2. MTN (Mobile Telephone Network)

MTN is the second largest cell provider in South Africa with over sixteen million subscribers. Unlike Vodacom – MTN has been very aggressive in Africa and the Middle East. Currently outside South Africa MTN is active in the following countries:

- Afghanistan;
- Benin;
- Botswana;
- Cameroon;
- Republic of Congo;
- Cote d’Ivoire;
- Cyprus;
• Ghana;
• Guinea Bissau;
• Republic of Guinea;
• Iran;
• Liberia;
• Montenegro;
• Nigeria;
• Rwanda;
• Sudan;
• Swaziland;
• Syria;
• Uganda;
• Yemen; and
• Zambia.

4.5.3. **Cell C**

Cell C was formed by Saudi Oger and CellSAf, its initial indirect fifty-four percent and forty percent shareholders, to participate in the tender issued by ICASA for a digital GSM 900 and 1800 dual band mobile license in South Africa. Cell C received an operating license in June 2001. In November 2001, Cell C completed the initial implementation of its core network. Cell C also entered into a national roaming agreement with Vodacom that enabled it to route calls over Vodacom's national GSM 900 network. In July 2003, Cell C began rolling out community service telephones, or CSTs, in line with its license obligations (Oger Telecom, n.d.).
4.5.4. Virgin Mobile

In December 2005, Cell C reached an agreement with the Virgin Group to launch a service provider through a fifty-fifty joint venture, Virgin Mobile South Africa (VMSA). Cell C believes that the joint venture will enhance its offering by targeting the upper end of the telecommunications market, where Cell C has traditionally had the lowest penetration and by capitalizing on the Virgin brand, which is seen as one of the premium brands in South Africa.

Virgin Mobile JV launched reselling (Virgin product) operations in the second quarter of 2006. Cell C provides all network services to the JV, as JV is providing its own I.T. infrastructure. VMSA has own billing, customer care, and ERP (Oger Telecom, n.d.).

4.6. INTERNATIONAL GSM MARKET OPERATORS

The Vodafone Group, T-Mobile, China Mobile and AT&T are among the top GSM operators in the world.

4.6.1. Vodafone group Plc.

Vodafone Group Plc. has a significant presence in Europe, the Middle East, Africa, Asia Pacific and the United States through the subsidiary undertakings, joint ventures, associated undertakings and investments. The group's mobile subsidiaries operate under the brand name Vodafone. In the United States the group operates as Verizon Wireless. During the last few years, Vodafone Group has entered into arrangements with network operators in countries where Vodafone does not hold an equity stake. At 31
December 2009, based on the registered customers of mobile telecommunications, it had 333 million customers (Vodafone Group Plc, 2009).

4.6.2. Deutsche Telekom (T-Mobile)
T-Mobile International is one of the world's leading companies in mobile communications. As one of Deutsche Telekom's three strategic business units, T-Mobile concentrates on the most dynamic markets in Europe and the United States. T-Mobile branded services are provided to some 80 million customers in nine countries. T-Mobile is also a partner of FreeMove, an alliance formed by four of Europe's mobile companies - Orange, Telefonica Moviles, TIM (Telecom Italia Mobile) and T-Mobile - to help their customers communicate as easily while travelling abroad as they do at home (T-Mobile, 2010).

4.6.3. China Mobile Communications Corporation
China mobile reports 544 million customers as at 30 April, 2010 (China Mobile Ltd, 2010).

China Mobile operates not only basic mobile voice services but also value-added services such as data, IP telephone and multimedia. It has the right to operate Internet services and the international gateways (China Mobile Ltd, 2010).

4.6.4. AT&T
With approximately 85 million customers AT&T is the 2\textsuperscript{nd} largest provider in the US after Verizon. AT&T was the first carrier to provide the Apple iPhone and Google’s Android mobile phones (AT&T, 2010).
4.7. CONCLUSION

This chapter provided a brief introduction into the mobile technology environment in which the case study operates. This chapter also finalizes the literature study. The following chapter will discuss the research design and research methodology.
CHAPTER FIVE
RESEARCH DESIGN AND METHODOLOGY

5.1. INTRODUCTION
This chapter discusses the research methodology that was followed. The chapter concludes with a discussion of the reliability and validity measures undertaken.

5.2. METHODS EMPLOYED

5.2.1. Qualitative research
A qualitative research approach was used in order to understand the impact of historical decisions in the family business on the current and future sustainability of the firm. Qualitative research seeks to provide a deeper understanding of social phenomena (Silverman, 2000) while quantitative research methods are more useful in hypothesis testing.

Quantitative research attempts precise measurement of something. In business research, quantitative methodologies usually measure consumer behaviour, knowledge, opinions or attitudes. Such methodologies answer questions related to how much, how often, how many, when and who. The purpose of qualitative research is based on “researcher immersion in the phenomenon to be studied, gathering data which provides a detailed description of events, situations and interaction between people and things, providing depth and detail” (Cooper & Schindler, 2008).
Several key distinctions can be made between quantitative and qualitative as illustrated in Table 5-1.

<table>
<thead>
<tr>
<th></th>
<th>Qualitative</th>
<th>Quantitative</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Focus of research</strong></td>
<td>• Understand and interpret</td>
<td>• Describe, explain and predict</td>
</tr>
<tr>
<td><strong>Researcher involvement</strong></td>
<td>• High - researcher is participant or catalyst</td>
<td>• Limited; controlled to prevent bias</td>
</tr>
<tr>
<td><strong>Research Purpose</strong></td>
<td>• In-depth understanding; theory building</td>
<td>• Describe or predict; build and test theory</td>
</tr>
<tr>
<td><strong>Sample Design</strong></td>
<td>• Nonprobability; purposive</td>
<td>• Probability</td>
</tr>
<tr>
<td><strong>Sample Size</strong></td>
<td>• Small</td>
<td>• Large</td>
</tr>
<tr>
<td><strong>Research Design</strong></td>
<td>• May evolve or adjust during the course of the project</td>
<td>• Determined before commencing the project</td>
</tr>
<tr>
<td></td>
<td>• Often uses multiple methods simultaneously or sequentially</td>
<td>• Uses single method or mixed methods</td>
</tr>
<tr>
<td></td>
<td>• Consistency is not expected</td>
<td>• Consistency is critical</td>
</tr>
<tr>
<td></td>
<td>• Involves longitudinal approach</td>
<td>• Involves either a cross-sectional or a longitudinal approach</td>
</tr>
<tr>
<td><strong>Participation Preparation</strong></td>
<td>• Pre-tasking is common</td>
<td>• No preparation desired to avoid biasing the participant</td>
</tr>
<tr>
<td><strong>Data Type and Preparation</strong></td>
<td>• Verbal or pictorial descriptions</td>
<td>• Verbal description</td>
</tr>
<tr>
<td></td>
<td>• Reduced to verbal codes (sometimes with computer assistance)</td>
<td>• Reduced to numerical codes for computerised analysis</td>
</tr>
<tr>
<td><strong>Data Analysis</strong></td>
<td>• Human analysis following human or computer coding; primarily non quantitative</td>
<td>• Computerised analysis - statistical and mathematical methods dominate</td>
</tr>
<tr>
<td></td>
<td>• Forces researcher to see the contextual framework of the phenomenon being measured - distinction between facts and judgements are clear</td>
<td>• Analysis may be on-going during the project</td>
</tr>
<tr>
<td></td>
<td>• Always on-going during the project</td>
<td>• Maintains clear distinction between facts and judgements</td>
</tr>
<tr>
<td><strong>Insights and Meaning</strong></td>
<td>• Deeper level of understanding is the norm; determined by type and quantity of free-response questions</td>
<td>• Limited by the opportunity to probe respondents and the quality of the original data collection instrument</td>
</tr>
<tr>
<td></td>
<td>• Researcher participation in data collection allows insights to form and be tested during the process</td>
<td>• Insights follow data collection and data entry, with limited ability to re-interview participants</td>
</tr>
<tr>
<td><strong>Research Sponsor Involvement</strong></td>
<td>• May participate by observing research in real time or via taped interviews</td>
<td>• Rarely has either direct or indirect contact with participant</td>
</tr>
<tr>
<td><strong>Feedback Turnaround</strong></td>
<td>• Smaller sample sizes make data collection faster for shorter possible turnaround</td>
<td>• Larger sample sizes lengthen data collection; Internet methodologies are shortening turn-around but inappropriate for many studies</td>
</tr>
<tr>
<td></td>
<td>• Insights are developed as the research progresses, shortening data analysis</td>
<td>• Insight development follows data collection and entry, lengthening research process; interviewing software permits some tallying of responses as data collection progresses</td>
</tr>
</tbody>
</table>
Researchers prefer to adopt qualitative and case-based approaches to explore issues of information technology in organisational setting (Ogbonna & Harris, 2005). Exploring issues of information technology can uncover significant insights into the attitudes of owners and managers as well as the full range of contextual issues underlying the adoption and change of information technology systems (Winston & Dologite, 2002).

Case study research can be defined as an empirical inquiry into a contemporary real life situation in which multiple sources of evidence are used (Yin, 1984). Jensen and Rodgers (2001) provided a case study typology defining case studies in a number of ways:

- **Snapshot case studies** are defined as a detailed study of one research entity at one point in time;
- **Longitudinal case studies** are a study of a single entity at multiple time points;
- **Pre-post case studies** are a number of case studies written on a single business with comparative analysis of each case study over time;
- **Patchwork case studies** are a set of multiple case studies of the same entity using either snapshot, longitudinal or pre-post methodologies; and

### Data Security

- More absolute given use of restricted access facilities and smaller sample sizes
- Act of research in progress is often known by competitors; insights may be gleaned by competitors for some visible, field based studies

Source: Cooper & Schindler (2008)
Comparative case studies are a set of multiple case studies of multiple businesses in order to analyse similar situations across various businesses for comparative reasons.

In the case study, interview participants are invited to tell the story of their experience, with those chosen representing different levels within the same organisation. The objective is to obtain multiple perspectives of a single organisation, situation, event or process at a point in time or over a period of time (Cooper & Schindler, 2008).

According to Yin (1994) a qualitative case-study approach should be used when:

- Based on the type of research question: typically to answer questions like “how” or “why”; 
- Extent of control over behavioural events: when investigator has a little/no possibility to control the events; and 
- General circumstances of the phenomenon to be studied: contemporary phenomenon in a real-life context.

5.2.2. Verification

Challenges towards validating or demonstrating reliability, validity and generalisation in the qualitative paradigm continue to be raised from the quantitative community and questions are also being raised from within the qualitative community. This is to be encouraged, as debate will enable further clarity and ultimately
lead to greater understanding and transparency (Tobin & Begley, 2004).

Morse, Barrett, Mayan, Olson and Spiers (2002) state that verification is the process of checking, confirming, making sure, and being certain. In qualitative research, verification refers to the instruments used during the process of research to incrementally contribute to ensuring reliability and validity and, thus, the rigor of a study. These mechanisms are woven into every step of the inquiry to construct a solid product (Creswell, 1997; Kvale, 1989) by identifying and correcting errors before they are built into the developing model and before they threaten the analysis.

Morse et al. (2002) outline five verification strategies to ensure reliability and validity of data in qualitative research:

1. Methodological coherence. Ensure congruence between the research question and the components of the method. The interdependence of qualitative research demands that the question match the method, which matches the data and the analytical procedures. As the research unfolds, the process may not be linear. Data may demand to be treated differently so that the question may have to be changed or methods modified. Sampling plans may be expanded or change course altogether. The fit of these components with data to meet the analytical goals must be coherent, with each verifying the previous component and the methodological assumptions as a whole.

2. Samples must be appropriate. Participants who best represent or have knowledge of the research topic should
be chosen. Sampling adequacy, evidenced by saturation and replication (Morse, 1990), means that sufficient data to account for all aspects of the phenomenon have been obtained.

3. Collect and analyse data concurrently. The iterative interaction between data and analysis is the essence of attaining reliability and validity.

4. Think theoretically. Ideas emerging from data are reconfirmed in new data; this gives rise to new ideas that, in turn, must be verified in data already collected. Thinking theoretically requires macro-micro perspectives, inching forward without making cognitive leaps, constantly checking and rechecking, and building a solid foundation.

5. Theory development. Move with deliberation between a micro viewpoint of the data and a macro conceptual/theoretical understanding. In this way, theory is developed through two mechanisms:
   a. as an outcome of the research process, rather than being adopted as a framework to move the analysis along; and
   b. as a template for comparison and further development of the theory.

Together, all of these verification strategies incrementally and interactively contribute to and build reliability and validity, thus ensuring rigor. Thus, the rigor of qualitative inquiry should thus be beyond question, beyond challenge, and provide pragmatic scientific evidence that must be integrated into our developing knowledge base (Morse et al, 2002).
Triangulation is a tried and tested means of offering completeness. Denzin (1970) identified four types of triangulation:

1. Data triangulation, which entails gathering data through several sampling strategies, so that slices of data at different times and social situations, as well as on a variety of people, are gathered.
2. Investigator triangulation, which refers to the use of more than one researcher in the field to gather and interpret data.
3. Theoretical triangulation, which refers to the use of more than one theoretical position in interpreting data.
4. Methodological triangulation, which refers to the use of more than one method for gathering data.

Tobin and Begley (2004) claim that triangulation alone is not good enough and should be complemented with goodness. Goodness is a means of locating situatedness, trustworthiness and authenticity (Smith, 1993; Denzin & Lincoln, 2000; Arminio & Hultgren, 2002).

Arminio and Hultgren (2002) recommend that there should be at least six elements in an interpretive study through which goodness is shown:

1. Foundation (epistemology and theory) – this provides the philosophical stance and gives context to and informs the study;
2. Approach (methodology) – specific grounding of the study’s logic and criteria;
3. Collection of data (method) – explicitness about data collection and management;
4. Representation of voice – researchers reflect on their relationship with participants and the phenomena under exploration;
5. The art of meaning making (interpretation and presentation) – the process of presenting new insights through the data and chosen methodology; and
6. Implication for professional practice (recommendations).

5.2.3. Data collection
Interviews were open-ended guided by the questionnaire in Appendix A2. I.T. Questionnaire and recorded by means of a laptop. Interviews were conducted one-on-one.

All three people interviewed are members of the management team and are:

- Mr W – Owner;
- Mrs C – Executive Manager and daughter of Mr W; and
- Mr R – I.T. Manager and married to Mrs C.

5.3. Conclusion
This chapter dealt with the research methodology.

The qualitative research method was explained and defended as opposed to quantitative research. The case-study method of data collection was explained.
The issues of reliability and validity of the qualitative case-study approach where highlighted.

The main findings are as follows:

- A qualitative research in the form of a case study is valid for the purpose of this research
- Validity and reliability are obtained using the following tools:
  - More’s five verification strategies;
  - Triangulation through interview with multiple participants; and
  - Completeness.

The following chapter will focus on the research findings.
6.1. INTRODUCTION

This chapter will provide the findings of the interview with the owner, owner’s daughter and son-in-law which were performed individually over two separate sessions. The first interview focuses mainly on the company, its governance and ownership and is described in the first half of this chapter. The second interview covers the I.T. angle. Questions and answers are outlined in detail in the 2nd half of this chapter.

6.2. DESCRIBING THE CASE

Mr W, owner and founder of Company D, started his entrepreneurial career in 1973 in the motor vehicle industry and as a property developer. After a triple bypass operation in November 1995, Mr W was advised to reduce stress.

It was during this time that the cellular industry was launched in South Africa. Mr W started selling second hand imported cell-phones from a room in his home – and was joined by his brother-in-law Mr D. During 1996 and 1997 the prepaid top-up cards started emerging – a Vodacom R250.00 was the first denomination available. Selling prepaid cards was a natural complement to the existing second hand cell phone business and resulted in often having to travel to customers to demonstrate on how to top-up prepaid airtime.
The business focused on a wholesale model and gaining market share was through a simple weekly ad in the Weekend Post, which is still in use today. In 1999 the company moved from the bedroom into a detached house due to the ever increasing requirements for storage space. At the same time Mrs H joined full-time. Her role was to take responsibility of the accounts such as daily reconciliations, debtors, creditors and stock control.

Nationwide expansion followed shortly there-after with the distribution of starter packs. Sales also increased when Vodacom launched more affordable denominations such as the R110.00 and R55.00 voucher. Since these cards where plastic and/or paper cards distribution took place via courier.

Expansion took off in the Cape-Town area where son-in-law Mr R, and Mr W’s brother-in-law, would distribute vouchers and starter-packs in the Cape Town area, albeit through their own company entities. Similar distributions took place in Bloemfontein and Grahamstown of which the later was run by Mr G – Mr W’s brother. Through the use of dial-up connections sales figures, stock levels and VAT figures could be checked daily from the head-office in Port Elizabeth to these remote sites.

Prepaid airtime was not as available as it is today. Banks and large retailers, unlike today, did not offer airtime – so most distribution took place through smaller outlets.

In 1999 MTN also approached Company D to start distribution MTN’s products.
During this time the physical hard cards were slowly being replaced by virtual cards. The cards would contain the same information (i.e. expiry date, pin number, serial-number and denomination) but instead of delivery by courier a virtual card can be delivered electronically through the distribution channel. Virtual cards are printed onto blank paper when downloaded by the customer. Distribution of the printed product would then take place to nearby café’s, supermarkets, petrol stations etc. Printing typically takes place on a high-speed bulk printer which is able to print more than one hundred thousand cards in less than an hour.

The adoption and integration of I.T. (software and/or hardware) has always been an integral part of the business. When the business was founded – the accounting would take place on an accounting package. In later years distribution of virtual products would take place through a software package made available by one of the suppliers.

In 2003 MTN launched a business model where tier-one distributors would earn on-going revenue on starter packs. Previously the distributors would only earn a commission on the sale of a starter-pack; however in this new model distributors would also earn on-going revenue whenever a starter-pack was topped up. Unlike other tier-one distributors, Mr W decided to share the on-going revenue on starter packs with his distributors – an industry first. For this a software package was developed by an outside consultant to keep track of activations and commission earned by each of the distributors and the revenue would be paid out on a monthly basis.
As the business was growing the remote offices where consolidated into the head office and Mr R moved to Port Elizabeth to become a full-time employee.

In early 2008 Mr W decided to develop an in-house custom based package for the distribution of virtual airtime. Although the motivation for developing his own system had been on the cards for several years – Mr W decided to rather re-invest in growing his current business then to lay out the money on software development.

The software development was done for the following main reasons:

1. The company which supplied Company D with distribution software was bought out by Vodacom. Mr W was concerned that all his customers could be taken away by Vodacom and/or other suppliers – no contracts with clients and cut-throat markets dictate that one should safeguard ones clients;

2. There was no website where customers could purchase and download their own stock. Customers had to phone in to place orders and the allocation of stock was still a manual process. Integration of the vendor supplied software into an online system would be cumbersome and challenging.

3. The software from the supplier contained bugs and was not very user-friendly – database crashes often lead to delays in delivering product -resulting in upset customers; and

4. Request for changes / fixes often fell on deaf ears – “tomorrow is another day”.

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An in-house developed package would prevent competitors and/or suppliers from getting hold of Company D’s customer base. Bug fixes would be quicker and therefore improve service to the end-user by implementing in-house solutions. Also new requests would be implemented faster.

Over the years several competitors have offered integrated solutions for the distribution of airtime – usually taking a “clicking” or “switching” fee – a percentage amount of turnover pushed through the system. However due to the fact that one puts ones customers on a competitors system does not bode well with business owners.

Another advantage was the integration of the stock delivery system with the accounting system – the daily routine of manually capturing invoices was eliminated. Further integration took place with payment gateways. Since most customers pay via direct deposit or EFT, an SMS would be sent from the bank to the system which would automatically load the credits onto the customer’s account. This shifted the business from a 09:00 – 17:00 operation to a 24/7/365 operation.

A natural progression was the mobile vending – also known as E.V.D. (Electronic Voucher Distribution). After extensive research over the first 3 months in 2009 a terminal was selected for Company D’s mobile vending platform – 4 months later the software was entering a pilot phase. Today over 120 machines are vending and more than 30 new machines per month are deployed nationwide using the mobile E.V.D. platform.
The advantage of the system is the colour-touch screen operation. This benefits illiterate users – who can vend products by clicking on an image. Competitor’s solutions are often more complex – slow and no graphical user interface often requires users to scroll through menus before reaching the required action. Although Company D’s machine has more advanced features its pricing is less or equal to that of the competitors vending solutions.

The mobile system has been developed with a partnership agreement – including a revenue share - with an outside software development company. The reason for this was to eliminate issues three and four mentioned previously: guaranteed support and continuous development of new products and features.

The next generation of software currently under investigation does not require a PIN code to be entered. Basically the monetary amount will be transferred directly to the user’s account which is held with the cellular provider. Since mobile development in
certain African countries started quite late – some of these countries went straight onto a pin-less system thereby skipping pin distribution whether physical or virtual. Pin-less is the predominant top-up method in Nigeria (Louw, 2008). Mr W is currently investigating the implementation of this system.

6.2.1. Trust

Mr W’s strong belief in trust became the driving force for employing family members and family friends. Initial profits were small and theft of valuable prepaid stock could easily eradicate those profits. In Mr W’s own words: “trust is more important than performance”. The care and personal relationship of Mr W with his employees is clearly evident in the organogram of the organisation, depicted in Appendix C Organogram. Most employees have a direct report to Mr W and the managerial staff fulfilling a support role.

6.2.2. Conclusion

Today the company does over one hundred million rand in turnover per month – starting in 1995 with only a “few hundred rand”. Although the business could be sold and Mr W could retire comfortably – that would mean his employees would potentially be left without a job. Besides taking care of his employees Mr W clearly states that he enjoys the work. On the topic of succession Mr W’s comments are that he’ll consider working half-days by the age of ninety.
6.3. I.T. QUESTIONNAIRE AND ANSWERS

Question 1. At what stage would you say Company D is in the life-cycle and why?

<table>
<thead>
<tr>
<th>Life Cycle Stage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Conception and development</td>
</tr>
<tr>
<td>2. Commercialisation</td>
</tr>
<tr>
<td>3. Growth</td>
</tr>
<tr>
<td>4. Stability</td>
</tr>
</tbody>
</table>

Company D is currently in the growth phase and will remain there. The challenge with Company D, and with most companies today, is that they should not accept stability. In high technology industries and markets new technology will continuously evolve, therefore to assume a stability mind-set and not keep up with the trends will cause companies to lag behind. Existing competitors or new market entrants taking advantage of new technology can continue to gain market share.

Although turnover increased with over fifty percent last year, the newly built software platform is capable of processing significantly more. The current mind set it to fully exploit the systems capabilities, without any additional expense, through growth in market share.
**Question 2. With which of the six phases of I.T. adoption, shown below, do you identify Company D and why?**

Company D definitely is in the infusion stage. All processes which were either manual or using disparate systems requiring data-re-entry or conversions have been merged into one platform. Company D is currently reaping the benefits of these investments and will continue to do so in years to come. New product configuration takes a matter of hours to implement and can be made available with the 800+ distributors with minimum effort and maximum effectiveness. The software constantly evolves to address ever changing requirements. Company D also works closely with major customers to integrate with maximum effect into their supply chain through the use of standardised tools.

In line with question one – the current owner’s vision is to capitalize on the new system. The past three years have been focused on process optimisation and I.T. integration / routinisation. With thoroughly tested systems in place – all that is left is to increase market share, turnover and profit.

**Question 3. Which external motivators drive I.T. adoption at Company D?**

Referring back to question one – for companies operating in high technology environments it is crucial to continue exploring new
technology. The main technological driver for Company D is constant pressure from competitors. If new products and/or services become available it is best to implement them – or someone else will. High performance companies will try to copy solutions from competitors or improve on them and bring them to market.

Another high external motivator – particular to the mobile prepaid vending segment is the added security for the end-user. Customers were previously sitting with between R5000.00 and R20 000.00 worth of physical stock at their store – posing a security risk. With the use of mobile terminals the theft issue has been significantly reduced. If a terminal is stolen – it is immediately deactivated and becomes worthless.

The availability of the Internet emerged a new type of customer. The ordinary person working a day job can now supplement their income with an after-hours business at home. The solution provided by Company D makes it very easy to place orders for stock, print the stock and distribute it without requiring much time and effort nor huge overheads. All that is required for the customer to trade is a PC with Internet connection and a printer.

Supplier forces also have an impact on the adoption of I.T. The implementation of RICA (Regulation of Interception of Communications and Provision of Communication-Related Information Act) requires everyone who has an active cell phone number or purchases a new Prepaid Starter Pack, to register their SIM cards. Some suppliers have simply given up – but Company D
continued looking for solutions – the current E.V.D. terminal allows vendors to RICA their customers.

Question 4. Which internal motivators drive I.T. adoption at Company D?

The owner’s vision was to be self-reliant – not having to rely on suppliers to provide tools or infrastructure for Company D to operate, which Company D relied upon heavily before. Being able to specify the requirements and processes which fit Company D and transform those into a software platform was a big motivator to implement a fully automated I.T. solution.

With integrated systems stock forecasts have become more accurate. Stock orders need to be placed on time. Too much stock results in money tied up; too little stock and the company risks losing customers.

Another important driver is to lock the customer in – prevent the customer from switching between providers – switching costs are low and the competition is intense in the prepaid cellular market. By providing customers with a user-friendly and easy to operate tools they are able to run a successful business.

Customer service and service availability are important motivators for adopting information technology. For example Company D offers its customers 24/7 online order availability whereas most of the competitors only offer service on work-days during work-hours.
**Question 5. Is there an I.T. budget, if so provide R allocations (preferably for current year and last year and next year’s budget)?**

There is no budget in place. Capital expenses required are provisionally planned. Operational expenses such as additional training etc. are only required on an ad-hoc basis and are not budgeted for.

**Question 6. Does Company D make use of external business consultants (I.T. and non-I.T.) and what are their roles/responsibilities?**

- Please provide enough level of detail of the functionality and why this role is outsourced.
- Clarify what the nature of outsourcing this role is (i.e. cost saving, lack of expertise)
- What type of relationship do you have with these business consultants?

The following areas of expertise are outsourced:

- Major I.T. decision making coupled with business strategy and business impact in the area of I.T. application; and
- Monthly accounting / auditing.

Consultants are involved to analyse business processes, provide a functional and technical specification and implement the solution – in cooperation with the daily management team at Company D. These consultants are kept on a retainer and have 24/7 support contracts in place to maintain the system and can be called upon in the event of problems.
Consultants are brought in because of lack of skill within the company – the positive side effect of using an outside person is the different view-point – challenging the status-quo.

The relationship is based on trust – with the value of stock easily being copied and sold a high level of trust has been built between the owner, management and the consultants. The consultants with their immediate family also frequent company social events, such as the annual company year-end function. This further cements the relationship – although this not being the immediate objective – “it’s just the way we treat people we work close with every day”.

The same applies to the accountants. Unlike the I.T. consultants, which are on contract and/or retainers, the accountants come in once / month to check the books, make corrections where necessary and bill the hours worked. Although senior management is capable of scrutinizing the books an objective and independent, unemotionally attached opinion, on the company’s financial well-being is important.

Occasionally the supplier for the accounting platform is called upon when bugs are discovered - but this is purely on an ad-hoc basis. The software has an annual license fee – which provides access to support and program updates, bug fixes, new features and enhancements.

**Question 7. What are the future expectations for Company D?**

Primarily the focus is on organic growth by expanding customer base. The current E.V.D. platform has reached approximately 150
machines. The objective is to increase that to 5000 machines in the next two years.

Future expectations are to continue keeping up with technological advances – closely monitoring the competition and enhancing and/or customizing these advances to suite Company D and its customers better. A new infrastructure platform utilising USSD (Unstructured Supplementary Service Data) technology is currently under development. This infrastructure platform will link in with the current mobile platform and allow any user with a cell phone to vend airtime.

The lack of skill is vital – and exposes an element of risk. Currently the know-how on the internals of the entire system vests with one company. If something were to happen to this company or the employees of this company there could be disastrous implications.

Expanding internationally into Africa is a logical extension of Company D’s business model. This expansion might take the form of a franchise type agreement – where the franchisee would have market knowledge in the foreign country and Company D will provide the tools and infrastructure to the franchisee to enable the distribution to take shape.

Question 8. What role will I.T. play in the previous question?

I.T. gives the firm enough flexibility to be able to respond to market changes and competitors new products. Company D will remain outsourcing the I.T. role since it is not Company D’s core business and focus will remain on customised fully integrated solutions.
The increased pressure on broad-band and telecommunications prices has already bared fruit. Wireless infrastructure is now an affordable backup option when ADSL lines go down, due to theft and other external influences.

**Question 9. How will Company D cope with this growth?**

Continue to work on customer satisfaction and improve customer relations. This can be implemented by adapting the business model to continuously add value. An example would be to implement a flexible discount structure, which will allow a unique discount for a client on a specific product.

Continuous I.T. integration is paramount to ensure timeous response to customer demands and cope with growth.

**Question 10. What implications might growth cause on the family business?**

A good example is the store which saw utilisation drop from 5 days per week to 2 days per week. Through I.T. implementation work is performed more efficiently and effectively by the software system. People are not re-trenched but are cross skilled to perform other functions such as support and sales roles.

Some of the loyal older generation associates who are currently working ½ days and are made redundant will still receive a salary.
CHAPTER SEVEN
ANALYSIS AND INTERPRETATION OF THE RESEARCH FINDINGS

7.1. INTRODUCTION

Chapter seven will link the theory from the literature review with the data gathered in the interview. From there critical opinions regarding the I.T. adoption strategy will be formed, both good and bad.

Answers to the research questions will be provided. The chapter will conclude with recommendations and fields for further research.

7.2. FAMILY BUSINESS

According to the definition from Ogbonna and Harris (2005) a family business is defined as a business in which more than fifty per cent of the shares are owned by a single family that is involved in the management of the business and where there is an intention of transferring the business from one generation of this family to another.

The data collected clearly indicates that Company D conforms to this definition in all three areas:

- Ownership is 100 per cent owned by the family;
- The family is involved in the management of the business; and
- There is a strong intention of transferring the business to the next generation.
Many of the benefits listed in Table 2-3 on page 14 apply to Company D.

Although no comparative data (N=1) is available the following conclusions can be drawn from the F-PEC questionnaire:

- High degree of power, therefore the family can influence the business via its ownership and management structure.
- Moderate degree of experience since the company currently has reached 2\textsuperscript{nd} generation. According to Astrachan et al (2002) the level of experience gained from the succession process is greatest during the shift from first to second generations. During the first generation of ownership, many new rituals are installed. Thus, second and subsequent generations of ownership contribute proportionally less value to this process (law of diminishing returns).
- The family is highly committed to the business.

Referring to the 4P model as elaborated on in chapter two, policies should be put in place. One such policy should be to compile annual operational and capital expense reports. This has the added benefit that goals are set and can be used to track the progress of the company performance, instead of just comparing to previous years financials.

Company ownership is currently solely vested with the founder and CEO of the business. The landscape of the mobile telecommunications is heavily relying on businesses focussing on the implementation of I.T. technology. Since the I.T. technology is
fairly accessible, the current critical success factors for businesses in this area are

- Maintain and grow customer base; and
- Continue to innovate and launch new products and improved services.

Product differentiation is not an appropriate strategy, since the product cannot be augmented or adapted to attract different customers – customers are not willing to pay more for a top-up voucher.

The firm is well versed in maintaining and growing the customer base, partly due to the family business characteristics such as looking after customers, relationships and thinking long-term in contrast to publically trading companies seeking short term profits or to satisfy investors.

On the other hand, innovation is strategically lacking at the firm. Although consultants do implement I.T. solutions, it remains a reactive process. Recommendations to develop a culture would be to convince the consultants to become part of the business and experience day-to-day businesses processes, customer’s needs & wants and become familiar with the market. This will develop the company from being reactive to proactive.
7.3. ADOPTION OF I.T. TECHNOLOGY

As indicated in the literature study the mobile telecommunications sector is heavily dependent on information technology to deliver products and services.

The absence of formally I.T. skilled employees in Company D left a gap that needed to be filled to be able to efficiently compete in the industry. Growth was clearly limited to the expertise of the business, which at the time depended on supplier’s inefficient, error-prone software and an expensive and ineffective delivery of product to the customer. These factors resulted in a stagnation of growth that the company was ill-equipped to address.

Company D therefore chose to fill the knowledge gap by outsourcing I.T. formulation and implementation to a company specialising in implementing custom software and infrastructure solutions.

The primary objective to adopt I.T. was from external pressure from rivals. By the time that Mr W perceived the company was ready to implement information technology, many of the competitors already had well established solutions in place and started targeting Company D’s customers with better products and services delivered at a better price.

Several examples of late adoption of technology can be found back in the literature which can be linked to the case study company:

- Lack of formal I.T. employees with the skills to implement complex system;
- SME’s have less financial resources (The Economist, 2007);
• Owner’s lack of I.T. knowledge (Thong & Yap, 1995);
• Not challenging the status-quo;
• Lack of innovative culture, which could be linked to the high age profile of the employees;
• As per Lefebvre and Lefebvre (1992) habit formation and a reluctance to change policy; and
• A reluctance to accept (trust) outsiders (Puiga & Pérez, 2009) in a position with great responsibility.

The company found itself in a far better position once the integrated I.T. solution was implemented. Company D is able to compete effectively in the market against its competitors with a range of easy to use software products which enable distribution and vending of prepaid airtime vouchers. Other advantages as found in the literature became immediate apparent as quoted in et al Grandon & Pearson (2004), The Economist (2007) and Mehrtens et al (2001):

• Cost savings;
• Ease of use;
• Ability to grow the business;
• Quality of products and services; and
• Raising productivity

The company’s goal is not to reach a stability stage. This is confirmed by the nature of the telecommunications market, as depicted in Figure 4-2 Virtuous Cycle.

Although Mr W states the company is in the top stage of I.T. adoption, innovation remains lacking. I.T. is still mostly regarded as
a tool and not seen as an enabler, evident through a mostly reactive behaviour in response to competitors launching new products and services. One example which can be found in the case-study is the implementation of the cell-phone vending platform (USSD).

7.4. RECOMMENDATIONS

The following recommendations can be made to prospective family business in the telecommunications sector when adopting I.T. technology:

- Embrace technology early, utilise I.T. solutions to grow and enhance current competitive advantage, do not see I.T. as a competitive advantage alone (Pavlou & Sawy, 2006);
- If information expertise is not present within the company it is advisable to invest in that expertise through recruitment, training, partnership, or outsourcing;
- Ensure software meets specification / is effective enough – this can be achieved by frequent releases cycles with small changes instead of infrequent release cycles with many big changes;
- Engage the consultants in a partnership by i.e. providing a profit share – this will ensure that the consultants are committed to the cause and will also ensure that their involvement is also in their own best interest;
- Choose local consultants who are easily accessible – build relationships and focus on trust;
• Create lock-in (Amit & Zott, 2001), provide tools free-of-charge for customers, this will make switching to competitor more difficult;

• Automate as much as possible, enable standard work practices, routinize;

• Adopt open source technologies where possible – to keep costs down;

• Be ready to adjust the organisational structure or relinquish control (Bruquea & Moyanob, 2007).

7.5. FURTHER RESEARCH

No evidence of ethnic differences or similarities in South African family businesses was found during the research. Segmentation into ethnicity for family business in South Africa such as black, white, Indian and Muslim could provide us with more insight into how different ethnic groups place more or less value on family ties or the reason behind starting a family business.
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APPENDIX A
QUESTIONNAIRE FOR FAMILY BUSINESS OWNER

A.1 F-PEC QUESTIONNAIRE WITH ANSWERS

Part 1: The power subscale

1. Please indicate the proportion of share ownership held by family and nonfamily members:
   a. Family: 100%
   b. Non-family: 0%

2. Are shares held in a holding company or similar entity (e.g., trust?):
   a. No

3. Does the business have a governance board: Yes
   a. Total persons: 4
   b. Family members: 3
   c. Non family members: 1

4. Does the business have a management board: Yes
   a. Total persons: 3
   b. Family members: 3
   c. Non family members: 0

Part 2: The experience subscale

1. What generation owns the company: 1st generation

2. What generation manages the company: 1st and 2nd generation

3. What generation is active on the governance board: 1st and 2nd generation
4. How many family members participate actively in the business: 8
5. How many family members do not participate in the business but are interested: 1
6. How many family members are not (yet) interested at all: 0

**Part 3: The culture subscale:**
Please rate the extent on a scale from 1 – 5. 1 Being “not at all” and 5 being “to a large extent”:

1. Your family has influence on your business: 5
2. Your family members share similar values: 5
3. Your family and business share similar values: 5

Please rate the extent to which you agree with the following statements from 1 - 5, 1 being “strongly disagree” and 5 being “strongly agree”:

4. Our family members are willing to put in a great deal of effort beyond what is normally expected in order to help the family business be successful: 5
5. We support the family business in discussions with friends, employees and other family members: 3-4
6. We feel loyalty to the family business: 5
7. We find that our values are compatible with those of the business: 5
8. We are proud to tell others that we are part of the family business: 5
9. There is so much to be gained by participating with the family business on a long-term basis: 5
10. We agree with the family business goals, plans and policies: 5
11. We really care about the fate of the family business: 5
12. Deciding to be involved with the family business has a positive influence on my life: 5
13. I understand and support my family’s decisions regarding the future of the family business: 5
A2. I.T. QUESTIONNAIRE

Question 1. At what stage would you say Company D is in the life-cycle and why?

<table>
<thead>
<tr>
<th>Life Cycle Stage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Conception and development</td>
</tr>
<tr>
<td>2. Commercialisation</td>
</tr>
<tr>
<td>3. Growth</td>
</tr>
<tr>
<td>4. Stability</td>
</tr>
</tbody>
</table>

Question 2. With which of the six phases of I.T. adoption, shown below, do you identify Company D and why?

- initiation: active or passive search for opportunities;
- adoption: negotiations for backing I.T. implementation;
- adaptation: applying the I.T. and revising organisational procedures;
- acceptance: company members are encouraged to use the I.T.;
- routinisation: the use of the I.T. becomes standard; and
- infusion: efficiency is increased as a consequence of the I.T. use.

Question 3. Which external motivators drive I.T. adoption at Company D?

Examples:
• pressure from competitors, customers or suppliers;
• the role of government (incentives);
• partners’ alliances;
• technological infrastructure;
• technology consultants;
• image of Internet technology; and
• users’ expectations.

**Question 4. Which internal motivators drive I.T. adoption at Company D?**

Examples:

• Reduce cost;
• Raise service quality;
• Raise employees productivity;
• Create lock in with customers; or
• Add value for customers.

**Question 5. Is there an I.T. budget, if so provide R allocations (preferably for current year and last year and next year’s budget)?**

• Training;
• Standard software (off the shelf);
  o Antivirus etc.
• Custom software;
• Hardware;
  o Servers
  o PC’s & Laptops
  o Network equipment
• Infrastructure; and
• Additional employees.
Question 6. Does Company D make use of external business consultants (I.T. and non-I.T.) and what are their roles/responsibilities?

- Please provide enough level of detail of the functionality and why this role is outsourced.
- Clarify what the nature of outsourcing this role is (i.e. cost saving, lack of expertise)
- What type of relationship do you have with these business consultants?

Question 7. What are the future expectations for Company D?

- Organic growth, acquisitions;
- Competitors influences;
- Product expansion;
- Impact of lack of skill in business;
- Service expansion/delivery i.e. new business platforms;
- Market growth; or
- International expansion.

Question 8. What role will I.T. play in the previous question?

Question 9. How will Company D cope with this growth?

Question 10. What implications might growth cause on the family business?
## APPENDIX B
### FAMILY BUSINESS EMPLOYEES

<table>
<thead>
<tr>
<th>Name</th>
<th>Tagiuri &amp; Davis Index</th>
<th>Age</th>
<th>Gender</th>
<th>Relation</th>
<th>Job Title</th>
<th>Length of tenure (Yrs)</th>
<th>Use of PC</th>
<th>Use of I.T.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mr W</td>
<td>7</td>
<td>67</td>
<td>M</td>
<td></td>
<td>Managing Director &amp; Owner</td>
<td>11</td>
<td>yes</td>
<td>Accounting packages</td>
</tr>
<tr>
<td>Mrs H</td>
<td>4</td>
<td>58</td>
<td>F</td>
<td>sister</td>
<td>General Office Manager</td>
<td>11</td>
<td>yes</td>
<td>Payroll for employee salaries</td>
</tr>
<tr>
<td>Mrs Z.R.</td>
<td>4</td>
<td>36</td>
<td>F</td>
<td>niece</td>
<td>Admin Manager</td>
<td>10</td>
<td>yes</td>
<td>Accounting package</td>
</tr>
<tr>
<td>Mr M</td>
<td>4</td>
<td>56</td>
<td>M</td>
<td>brother-in-law</td>
<td>Operations Manager</td>
<td>10</td>
<td>yes</td>
<td>Order processing</td>
</tr>
<tr>
<td>Mrs C</td>
<td>4</td>
<td>46</td>
<td>F</td>
<td>daughter</td>
<td>Executive Manager</td>
<td>10</td>
<td>yes</td>
<td>Order processing &amp; accounting package</td>
</tr>
<tr>
<td>Mr J.B.</td>
<td>4</td>
<td>31</td>
<td>M</td>
<td>step son</td>
<td>I.T. Assistant</td>
<td>1 month</td>
<td>yes</td>
<td>Assist customers and employees with technical queries</td>
</tr>
<tr>
<td>Mr R</td>
<td>4</td>
<td>46</td>
<td>M</td>
<td>son-in-law</td>
<td>I.T. Manager</td>
<td>8</td>
<td>yes</td>
<td>Assist customers and employees with technical queries</td>
</tr>
<tr>
<td>Mr D.K.</td>
<td>4</td>
<td>71</td>
<td>M</td>
<td>brother-in-law</td>
<td>Admin</td>
<td>7</td>
<td>yes</td>
<td>Bulk printing of prepaid top-up-vouchers</td>
</tr>
<tr>
<td>Mr M.M.</td>
<td>1</td>
<td>28</td>
<td>M</td>
<td></td>
<td>Store Controller</td>
<td>5</td>
<td>yes</td>
<td>Order processing and packaging</td>
</tr>
<tr>
<td>Mr W.M.</td>
<td>1</td>
<td>51</td>
<td>M</td>
<td></td>
<td>General Assistant</td>
<td>4</td>
<td>yes</td>
<td>Scanning of starter packs</td>
</tr>
<tr>
<td>Mr D.C.</td>
<td>1</td>
<td>49</td>
<td>M</td>
<td></td>
<td>Delivery/sales</td>
<td>4</td>
<td>no</td>
<td>Order processing</td>
</tr>
<tr>
<td>Mr B.R.</td>
<td>1</td>
<td>75</td>
<td>M</td>
<td></td>
<td>Admin Assistant</td>
<td>4</td>
<td>no</td>
<td>None</td>
</tr>
<tr>
<td>Mrs E.G.</td>
<td>1</td>
<td>58</td>
<td>F</td>
<td></td>
<td>Receptionist</td>
<td>4</td>
<td>yes</td>
<td>Order processing and assist customers with queries</td>
</tr>
<tr>
<td>Mr A.L.</td>
<td>1</td>
<td>58</td>
<td>M</td>
<td></td>
<td>Delivery/sales</td>
<td>2</td>
<td>no</td>
<td>None</td>
</tr>
<tr>
<td>Mr S.N.</td>
<td>1</td>
<td>44</td>
<td>M</td>
<td></td>
<td>Representative</td>
<td>2</td>
<td>Yes</td>
<td>Sales tracking</td>
</tr>
<tr>
<td>Mr H.S.</td>
<td>1</td>
<td>26</td>
<td>M</td>
<td></td>
<td>Assistant Store Controller</td>
<td>2</td>
<td>yes</td>
<td>Order processing and packaging</td>
</tr>
<tr>
<td>Mrs D.K.</td>
<td>1</td>
<td>56</td>
<td>M</td>
<td></td>
<td>General Worker</td>
<td>2</td>
<td>no</td>
<td>None</td>
</tr>
<tr>
<td>Mr G.H.</td>
<td>1</td>
<td>67</td>
<td>M</td>
<td></td>
<td>Delivery/sales</td>
<td>2</td>
<td>no</td>
<td>None</td>
</tr>
<tr>
<td>Mrs J.B.</td>
<td>1</td>
<td>54</td>
<td>F</td>
<td></td>
<td>Admin Assistant</td>
<td>1</td>
<td>yes</td>
<td>Order processing</td>
</tr>
<tr>
<td>Mr D.E.</td>
<td>1</td>
<td>66</td>
<td>M</td>
<td></td>
<td>Delivery/sales</td>
<td>1</td>
<td>no</td>
<td>None</td>
</tr>
</tbody>
</table>