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Using ICT as a Value Adding Tool in South African SMEs

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Abstract

This article investigates how Information and Communication Technology (ICT) has been

used to add value to Small and Medium Enterprises (SMEs) in South Africa, particularly in the retail, production and service provision sectors. This

empirical study had three objectives. The first objective was to find out which ICTs South African SMEs are currently using. The second goal was to

investigate what SME owners perceived and what value ICTs added to their operations. Finally, the various barriers which SMEs face when adopting

ICTs were looked at. It was found that ICT does indeed add value to SMEs, the use of ICT differs between different sectors, and South African SMEs encounter a

number of critical barriers
in the process of adopting
ICT.

Keywords: ICTs, Small and Medium-sized Enterprises, Value, South Africa, Barriers to ICT Adoption.

Introduction

Information and
Communication
Technologies (ICTs) have
the potential to add

substantial value to the operations and the competitive position of Small and Medium-sized Enterprises (SMEs).
However, SMEs are often

reluctant to embracing
technological change and
rather adopt more
traditional approaches and
means of conducting
business and operations. In

order to compete on a much wider scale, the many benefits of ICT needs to be taken into consideration and awareness thereof needs to be raised.

This article investigates specifically at the role that Information and Communication (ICT) plays within Small to Medium Enterprises (SMEs) in

South Africa. The objectives of this study were threefold. Firstly, it aimed to find out which ICTs SMEs are currently using in South Africa. Secondly, to delve

into the perceived value added to SMEs through ICT adoption and thirdly, to uncover the various barriers SMEs face when adopting ICTs. The research

collected data from SMEs in three main sectors in South Africa by means of a questionnaire. The three sectors focused on were the retail, production and

service provision sectors in South Africa.

There has been limited research conducted on the use of ICT as a value adding

tool amongst SMEs in South Africa. The extent of use of different ICTS in SMEs, the stumbling blocks to actual adoption of ICT and the perceptions of SME owners

with regards to adoption and use have not been fully explored as yet. It remains to be seen, whether or not, ICT adds any value or brings any direct benefit to

SMEs in South Africa.

Hence, this study will be of immediate support to the growing SME sector in South Africa's economy and at the same time, will add

to the current literature of
ICT and SMEs in South
Africa.

Importance of Small Medium Enterprise (SME) in South Africa

SMEs are usually defined
according to the number of

employees within the enterprise, or on the value of assets. Hallberg (2000) classifies an enterprise with 250 employees as an SME (the definition also adopted

in this article), whereas Southern and Tilley (2000) stipulate 150 or fewer employees. Even though there is not one exact definition of the term Small

to Medium Enterprise,
there are however a
number of organisational
characteristics which can
be used to distinguish these
types of businesses from

large ones. Jentzsch and
Miniotas (1999)
characterize SMEs as
independently owned and
operated enterprises,
where most of the

operating capital is provided by the owner and the principal management and decision making is done by the owners.

In South Africa, SMEs are seen not only as a strong engine of economic growth and productivity, but also, as a means of distributing income amongst its

employees and their affiliates. The SME sector is seen as the most prospective part of South Africa's economy (Al Berry et al., 2002). The SME

economy sector increases the average productivity of labour in the country by employing the average unemployed low-skilled labour force who is actively

seeking employment
(Bacon & Hoque, 2005;
Locke, 2004).

Benefits of ICTs for SMEs

Selwyn (2002) states that
Information and
Communication
Technology is a term

including a wide range of
technological applications;
digital broadcast
technologies;
telecommunications
technologies as well as

electronic information resources. ICT therefore, encompasses a range of technologies, information and resources (Selwyn, 2002).

Information and
Communication
Technologies are seen as a
competitive tool for
enterprises (Modimogale
and Kroeze, 2009) and, if

implemented and used correctly, can bring with it many benefits for enterprises. These benefits include permitting collaboration between the

adopting business and
other businesses and
making the business faster
through more effective
processes, as well as giving
businesses the ability to

retrieve, store and process information much more efficiently (in terms of both cost and effort) (Taylor, 2004).

Information technology has shifted from being a resource barely employed in businesses to one of extreme importance, which businesses invest in to gain

competitive advantage (Carr, 2004). The main driver behind this shift or transformation is due to the assumption that information technology's

increase in ubiquity and potency has increased its strategic value (Carr, 2004).

Competitive advantage refers to the situation an

organisation finds itself in
when it implements a value
creating strategy which is
not being simultaneously
implemented by any of its
competitors (Hoffman,

2000). This competitive advantage becomes a sustainable one if none of the current or potential competitors in the industry are able to duplicate the

benefits of the strategy implemented. This allows the firm to be the only organisation in the respective industry to have this 'edge' and reap the

benefits thereof, whilst competitors are still using “older” means of doing business (Hoffman, 2000). According to Porter, businesses can gain a

competitive advantage in their respective industry in two main ways, namely cost advantage, or differentiation advantage (Porter, 2001). Both

sources of advantage can be gained by businesses through strategic positioning with the use of the internet (Porter, 2001).

The problem which arises with organisations gaining a competitive advantage is that it tends to be more of a once off occurrence than something sustained.

Peppard and Ward (2004) qualify this by stating that recent surveys on competitive advantage have deemed it both “temporary and non-lasting”. They also

see the problem to be that, although some ICT initiatives taken do reap rewards for the business that implements it, many of these initiatives can be

easily replicated by other competitors in the industry, thus causing any competitive advantage gained to be minimised quickly.

However, the insight to harness some ICT initiative's usefulness may not necessarily become ubiquitous, and that is where the opportunity for

strategic advantage within
Information Technology
lies. In order to extract real
value from IT, business
process re-engineering and
business process

innovation is required (Carr, 2004). First mover businesses, that is, those that tend to act on the possibilities that IT brings before rivals do, will

continue to differentiate themselves in the light of their respective industry competitors and thus, reap the economic rewards of the IT investment.

From an operational perspective, introducing ICTs into the value chain changes the way it operates and has a direct influence on the links between the

various functional units of an organisation. This relationship between ICT and an organisation's value chain with IT having the power to refine it and the

linkages within it, shows that IT plays a pivotal role in creating value for an organisation (Porter and Millar, 1985).

From a competitive perspective, Information Technology can change the rules of competition in various ways. Porter and Millar (1985) suggested

that there are five main competitive forces within an industry structure which determine industry profitability for an organisation. IT can affect

each of these forces as follows:

- Power of Buyers: IT makes information more widely available to larger

target markets, thus giving buyers' greater purchasing power through better and faster information.

- Power of Suppliers: IT allows suppliers to gauge supply and demand for their products much better, as they get better information on their inputs.

- Threat of New Entrants:
IT raises the barriers to entry in an industry.

- Threats of substitutes:
Physical products are

replaced by technology
driven substitutes.

- Rivalry amongst existing competitors: Organisations need to keep up to speed

with new technologies in order to avoid being the last to implement a certain technology and fall behind competitors. Process improvements using IT

need to be made constantly
to ensure competitive
advantage.

Constraints to ICT Adoption among SMEs

The acceptance and implementation of ICT in businesses have not had the

same outcome for all businesses. Not all small to medium business owners or micro-businesses have taken up ICT nor do they intend on doing so in the

near future (Ramsey, Ibbotson, Bell, & Gray, 2003).

SMEs face numerous barriers and obstacles that

complicate the adoption of
ICT. Successful ICT
adoption and
implementation rely on
both socio-economic and
technological issues; these

issues can be based on
internal or/and external
factors (Arendt, 2008;
Modimogale, 2008;
MacGregor, Vrazalic,

Carlsson, Bunker, & Magnusson, 2002)).

Walchzuch et al (2000) and Chitura et al (2008) categorised the barriers to

ICT use into four broad categories. These include, firm awareness and access to infrastructure, confidence in the security framework, ICT use among

business partners and
adaptation of business
processes (Chitura,
Mupemhi, Dube, &
Bolongkikit, 2008b;
Walczuch, Van Braven, &

Lundgren, 2000). The “Manager-Owner factors” category is a recent addition to the list, coming about as organisational and manager-owner factors are

recognised as influencing
ICT usage in small
businesses (Wagner, Fillis,
& Johansson, 2003) .

MacGregor et al. (2002) argued that some of the barriers to ICT adoption are unique to SMEs, and came up with the following list:
low level of existing

hardware technology, the need to see immediate returns on investment (ROI), whereas E-commerce/ICT is a long term investment resistance

to change, preference for traditional technologies such as normal telephone system or face to face interaction, lack of IT skills and technical knowledge

amongst employees, time constraints, lack of awareness about ICTs' business benefits, security concerns and finally, lack of ICT adoption among

business partners.
(MacGregor et al., 2002)

Walchzuch et al (2000) also consolidated a list of barriers SMEs face during

ICT adoption, into three categories: awareness of SMEs and access to infrastructure, confidence in the security framework and ICT use among

business partners and
adaptation of business
processes.

South African SMEs

South Africa is a developing country going through a growth period where exploiting different

technologies holds huge benefits for the country. SMEs have the ability to obtain a large advantage through using emerging ICT technologies, such as

internet and mobility
(Balocco, Mogre, & Toletti,
2009). To use an example,
the emerging technology of
VoIP is taking advantage of
the converging markets of

business. South African SMEs are thought to gain advantage through the potential use of mobile technologies. This is because a large proportion

of the population has cell phones, which provides an excellent means of information sharing (Vosloo et al., 2005).

Infrastructures that allow voice and data to merge are readily available, with Skype currently the most popular of these applications. SMEs and

other business types are starting to use these tools to communicate with clients and with each other. On the contrary, even though these technologies

are available, 90% of businesses still use the conventional telephone systems. This slow uptake does not encourage the use of more advanced

technologies (Vosloo et al., 2005).

The biggest problem in South Africa is the expensive connectivity

costs coupled with a lack in infrastructure which supports emerging technologies. South Africa has been developed in a disparate way, where the

urban areas have high end technologies whilst the rural areas remain underdeveloped and lacking basic infrastructures such as

electricity and telephone lines, resources needed to succeed in a knowledge economy. The South African Government is aware of the necessity to

partake in the global
knowledge economy.
Therefore, it has called for
Telkom, until recently the
monopolist fixed telephone
line infrastructure

provider, to reach South Africa's target by ensuring that the country is a connected one while at the same time reducing the cost of communication.

Research Methodology

The research was positivist in nature. An exploratory approach was used as our research investigated and

provided in-depth information in areas which have not been widely scrutinized. Both qualitative and quantitative research methods were

used. Qualitative research was conducted to gain a more detailed understanding of the extent of use of ICTs and their perceived value.

Alternatively, the quantitative research looked at the statistical significance of the barriers and opportunities faced by South African SMEs. Our

research was cross sectional due to time constraints.

A questionnaire covering the key research questions was drawn up:

- What ICTs are used by SMEs?

- What are the barriers to ICT adoption experienced by SMEs?
- What is the value obtained from ICTs use by SMEs?

The research questionnaire is available on request from the authors. The research made use of a purposeful as well as a stratified sampling. For the

purposeful sampling,
specific groups of SMEs
were selected from three
industries which were
identified as unique. These
included services,

production and retail. The SMEs were located both rurally and in urban areas. The stratified selection of SMEs was done in a random manner. In total, 300

questionnaires were sent out but only 33 useful responses were received, resulting in a response rate of 11%.

We used an informal approach to conduct the interviews and two series of questions were asked. The first section focused on semi-structured questions,

followed by queries which encouraged storytelling ethos. These questions were predominantly open-ended to encourage discussions. The focus of

the interviews was on both SMEs and ICT providers. The results obtained from the interviews were then compared and contrasted to the findings of the

questionnaires in order to analyse, whether or not, a correlation between the two existed.

South African SMEs and ICT Use

The primary objective was to find out which ICTs are used the most within

SMEs and to what extent SMEs in South Africa are making use of ICT. From the literature, we found that SMEs do tend not to invest into more advanced

technologies, when compared to larger organisations (Vosloo et al., 2005). In order to investigate ICT usage within SMEs, the first

hypothesis to be tested was based on the literature. An assumption was made that most SMEs adopt General ICT technologies, as compared to more

advanced ICT technologies.
The hypothesis was thus:

*H1: Most SME's use general
ICTs and relatively few use
advanced ICTs.*

In order to distinguish between different types of use and to test the hypothesis, ICT usage was categorised into three subsections of use namely;

General ICT technology
usage, Production-
Orientated ICT technology
usage and Advanced ICT
technology usage. Figure 1

summarises the use of
selected ICTs by SMEs.

Figure 1: Extent of ICT Use in SMEs

**Please see Figure 1 in full
PDF version**

The general use ICTs consisted of the following technologies: Internet access, Email, bulk SMS, VoIP, organisational website and intranet. The

findings showed that 80.8% of the SMEs in the sample have internet access, 96.2% of them use email, 23.1% use bulk SMS, 19.2% use VoIP, 17.4% have intranet

and 48% have an
organisation website.

The production-orientated
SMEs include ICTs such as,
Accounting packages

(52%), Production packages (60%), Inventory packages (64%), Human Resource packages (36%), Enterprise Resource Planning systems (ERP)

(20.8%), Customer Relationship Management applications (CRM) (32%) and Supply Chain Management (SCM) Systems (16.7%).

The advanced ICT SMEs use systems such as: Software as a Service (SaaS) (12.5%), cloud computing (0%), Content Management System (CMS) (8.7%),

mobile CRM (4.5%), mobile payment system (17.4%) and system virtualisation (16.7%).

Of the general ICT users, not many SMEs had adopted VoIP, but there was a positive 42.3% who intended to implement it and 38.5% had knowledge

of VoIP. Bulk SMS was only being used by 23.1% of the respondents, while 50% had knowledge on it and a fewer number of respondents intended to

implement it. Firms with intranet capabilities were very low, with a usage of 17.4% and 52.2% had knowledge of it. Most SMEs had internet access, email

services and a telephone
and fax line.

The production ICT users
had a high usage in
Production packages, with

60% using them and 16% intending to, Inventory packages had a 64% usage and Accounting systems were used by 52% of the SMEs in the sample. The

ERPs usage was not that prevalent with only 20.83% making use of them, but 41.7% of respondents stated that they intend to implement it. Only 16.7% of

the respondents were making use of Supply Chain Management systems with a promising 33.3% intending to adopt it.

Advanced ICT users were mostly using Mobile Payment systems and System Virtualisation, with 34.8% and 41.7% of the SMEs respectively

intending to adopt these technologies. None of the SMEs were making use of cloud computing, although 61.9% of the respondents intend to adopt it.

From the findings, it was clear that the sample consisted mainly of General use ICT users, followed by Production-orientated ICT users and very few SMEs

were using Advanced ICTs.
Thus H_1 is supported.

Figure 2: Usage Profiles Differences Amongst Industries

**Please see Figure 2 in full
PDF version**

There was a slight indication that the usage between the three industries in the sample differs, as shown in figure 2. It appears that the

Production industry uses the most general ICT technologies and the least advanced ICT technologies. The Services industry seemed to have invested

the most out of the three in
Advanced ICT technologies
and the Retail industry the
most in Production-
Orientated ICT
technologies. However,

these results are not fully conclusive since there were more production and retail SMEs in the sample than service SMEs.

Barriers to ICT adoption

The second component of the research investigated into the nature of the barriers experienced with

regard to ICT adoption and use within South African SMEs. More specifically, the research intended to look

into the perceived barriers for use of ICTs and whether or not South African SMEs experience critical barriers to adoption and usage. The hypothesis was that:

*H₂: South African SMEs
experience critical barriers
when using ICTs.*

A weighted average mean
score (1 = Strongly

Disagree; 3 = Neutral; 5 = Strongly Agree) was calculated for all the perceived barriers to ICT use, as found in the literature, and is depicted

in table 1 below. Based on the weighted average score, the key critical barriers to ICT adoption were “Lack of awareness of the benefits of ICT adoption and use”

followed by “Low employee skill level”. The least significant barriers were the “Lack of Access to ICT infrastructures” and “Resistance to change

within the organisation”
barriers.

Table 1: Perceived Critical Barriers to ICT Adoption

**Please see Table 1 in full
PDF version**

The above findings suggest that SMEs in South Africa experience critical barriers to ICT adoption and use. The outcome from a number of follow-up

interviews with SME owners in the sample revealed similar results, confirming the findings of the questionnaires. Most SME owners rated lack of

awareness as the key barrier to ICT adoption. Coupled with this, they all found another major barrier to be that there are no vendors who cater for

SMEs. The lack of knowledge of SME owners is not only with regards to the technologies available for use today, but also knowledge on who can

supply them with ICT services. Examples used were: lack of knowledge on where to go for a customised system for their enterprise and where they

can buy an off the shelf package and which ones they should buy, as they do not know which packages are most suited to their needs. Even though

“reliable sources of vendor independent information” did not appear to be a major barrier in the questionnaire responses, the interviews revealed it

to be a much bigger barrier. The reason for this could be that the SME owners filling out the questionnaire did not understand what the question meant, but when

asked about it in layman's terms they immediately understood and recognized it to be a strong attributing fact as to why they have not

adopted or invested heavily
in ICT.

SME owners also think that
ICTs are too expensive to
invest in and will cost more

than the value they might add, and most of them showed a lack of understanding of the benefits that result from use of ICTs. Another factor

that was revealed in the interviews with the SMEs was that of “after sales service”. Beside the fact that SME owners did not know who to consult for

help and the fact that SME owners are of the belief that consultants cater more for larger organizations than small, SME owners that have implemented ICT

in their organization said that the after sales service of the product was poor.

After product roll out in the enterprise, the consultants that were initially involved

in the roll out of the system
not available for further
support and the SME
owners, many of whom do
not have comprehensive
knowledge on ICT, were left

on their own with a system they did not know how to use properly and one that does not cater fully to their needs.

An overall lack of awareness therefore, seems to exist amongst SME owners in South Africa with respect to the availability of ICTs which they can

possibly use; knowledge on their respective benefits; as well as knowledge as to who to turn to for help with regards to both systems analysis and the design and

building of an actual system
for their needs.

Value Added through ICT Adoption

The third aspect of the research looked into the value added through ICT

use within SMEs in South Africa. The hypothesis assumed that using ICT in an organisation adds value to that organisation. The

hypothesis was formulated
as such:

*H3: ICTs are perceived by
SMEs to add value to their
business*

Table 2 summarises and ranks the perceived value added through ICT adoption. The key perceived benefits experienced by SME

owners focus on customer-centric improvements:
increase in customer satisfaction, faster turnaround time, better quality of service and

improved marketability.
However, some operational
benefits are also noted:
more efficient and effective
business processes.
Interestingly, employee-

centred benefits and financial impacts appear not to be major benefits from ICT adoption.

Table 2: Perceived Value through ICT Adoption

**Please see Table 1 in full
PDF version**

The interviews confirmed these findings. Despite the fact that most SMEs only engage in General ICT technologies as opposed to Production-Orientated and

Advanced technologies, SME owners still feel that investing in ICT can add considerable value to their enterprises. The interviews reveal that most SME

owners who have adopted ICT feel their organisation has turned out to be more marketable and they have been able to increase their customer base as a result.

SME owners who do not have an organisational website still believe that the internet is a good medium for them to advertise their business

through websites such as Gumtree and this can potentially increase their customer base. They also point out that adoption of ICTS has brought positive

changes in their business processes and their operations are now more efficient and effective, resulting in improved customer satisfaction.

However, some SME owners believe that the investment in ICT has been substantial and there has been no noticeable increase in revenue despite the

more efficient business processes. This observation further validates the findings of MacGregor et al (2002) who argued that SMEs need to see the

immediate returns on investment (ROI), whereas ICT is a long term investment.

The final section of this research investigates whether there is a relationship of the barriers to ICT adoption and the value gained from using ICT

within an SME. We used a Spearman Rank Order Correlation test to identify whether or not any relationship exists. The findings illustrate 6

significant correlations between some of investigated barriers to ICT and value propositions. Table 3 below depicts the results.

Table 3: Relationship between ICT Barriers and Value

**Please see Table 3 in full
PDF version**

Two value propositions namely quality of service (VQ1) and turnaround time (VQ10) are impacted by the barriers to ICT. Lack of employee IT skills (BQ1),

resistance to change (BQ5),
lack of awareness (BQ6)
and employee satisfaction
with traditional
technologies (BQ8)
adversely impact the

quality of service in SMEs
whilst turnaround time is
negatively impacted by
both unreliable vendor
information (BQ14) and

lack of employee IT skills
(BQ1).

It is interesting to note that
lack of employee IT skills
(BQ1), lack of awareness

(BQ6) and employee satisfaction with traditional technologies (BQ8) are the three most prominent barriers to ICT adoption whilst service quality and

turnaround time are 2nd
and 3rd most important
benefits of ICT adoption as
perceived by SMEs.

Conclusion

This research looked at the role that ICT plays within SMEs in South Africa and in particular, it looked at

using ICTs to add value to SMEs. Additionally, the critical barriers experienced by SMEs were also queried.

The research conducted revealed that SMEs in South Africa are currently investing mainly in General use ICT technologies, mainly due to the fact that

SME owners lack knowledge and awareness of the various technologies available for use, as well as the benefits to be gained from their use. Even though

SME owners are mainly adopting General use ICTs and prefer traditional methods of doing business, as opposed to new computerised methods,

they still perceive ICT adoption as beneficial and use it to add value to their enterprises. The research therefore, confirmed that ICT use in an enterprise

definitely does add value to the SME, with the highest rated value added being those of ICT helping the SMEs to improve their customer satisfaction

levels, as well as improving their levels of service, which also affect the customer.

The research further revealed the fact that South African SMEs experience critical barriers to ICT use within their enterprise. It was proven that the

barriers to ICT do not only affect the adoption and use thereof, but also have a negative effect on the value that could be gained from otherwise adopting ICT.

The most prevalent barriers included the fact that SME owners had an overall lack of understanding with regards to ICT. Many SME owners

also thought of ICT as a greater expense to the enterprise as compared to its added the value. An overall lack of understanding as to the

benefits of ICT is evident amongst the SMEs sampled in this research paper.

It would be interesting to see the results of this study

on a larger sample,
encompassing more
industries and regions
within South Africa. Many
of the SMEs in the sample
showed an intent to adopt

and use more advanced
ICTs in the near future.

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