Effect of evaluation on SMMEs’ new technology decision-making processes

The complex nature of difficulties and constraints encountered by small businesses in their operations identified Information Technology (IT) as a tool with the potential ability to enhance small, micro and medium enterprises (SMMEs) productivity, efficiency and growth. Despite the increased spend on IT, many SMMEs still do not understand the importance of IT investment evaluation in decision-making processes to realise potential and expected benefits. This study aimed at exploring the impact of evaluation and non-evaluation on the decision-making process of SMMEs when adopting new technology. A multiple case study was employed as the research strategy. SMMEs were selected using non-probability sampling techniques and purposive method. The unit of analysis consisted of 15 managers and/or owners of the selected SMMEs. Data were collected in the form of semi-structured interviews and analysed using thematic analysis whilst employing hermeneutics to derive deeper and richer meanings. SMMEs risk failing because of the impulsive and excessive buying of technology when disregarding evaluation of the technology for the business process. SMMEs often base their decision to adopt new technology on speculative and empirical knowledge from their personal judgement, communication preferences and individual experiences. The lack of proper understanding of the implications of adopting new technology for the business in entirety may lead to the adoption of inappropriate technology or the non-adoption of a potential new technology. The study therefore recommends a set of guidelines to assist SMMEs in the process of new technology decision-making.

Introduction

There is growing collective acceptance about the significant role small, micro and medium enterprises (SMMEs) play in the economies of both the developing and developed world, especially in stimulating economic growth through increased job creation and promoting innovation (Fatoki 2014). The impact of IT on the contribution of SMMEs to the economy of developing countries, such as South Africa, is well researched and documented (Berry et al. 2002; Ndzie, Herselman & Flowerday 2012; Nguyen 2009). Mohammad and Ismail (2009) and Al-Qirim (2007) also posit that the characteristics of IT are well founded in antecedents, and it is arguably the most important means of sustaining, facilitating and promoting SMMEs’ business operations and efficiency. The OECD (2010) describes IT as a tool that enables SMMEs to steadily develop in status nationally and globally, enhancing cross-country relationships and transactions in the global world. To achieve this it is necessary to identify and invest in technologies that can assist in increasing the efficiency of SMMEs.

Various studies have been carried out to investigate the motives behind the adoption and non-adoption of IT in various types of businesses, including SMMEs, with a vast majority of the work carried out in developed countries (Booyens 2011; Marais & Pienaar 2010; Uden 2007). The impact of new technology on the organisational performance is visible in aspects of profitability, efficiency, market value and shares, productivity, quality and competitive advantages. The concept of the adoption of new technological innovation as a powerful competitive weapon is illustrated and emphasised by past and present literature (Boateng et al. 2010; Chan, Chong & Zhou 2012; Mata, Fuerst & William 1995). Although SMMEs’ importance to economic development of South Africa is recognised, emphasis should be directed on SMMEs’ knowledge and acquisition of available technologies that can be utilised to improve business processes (Govender & Pretorius 2015). The importance of strategic business planning and operations is emphasised with research showing 70% to 80% of new SMMEs created in South Africa do not succeed within the first two years of operation (Adeniran & Johnston 2012).

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Introducing new technology within a company involves a broad decision-making process which not only affects the individual users but the stakeholders as well. The decision-making process is in alignment with many of the technology acceptance models that embrace the fact that social, environmental, organisational and governmental factors contribute to the user’s perception and acceptance of new technology (Abulrub, Yin & Williams 2012; Cowan & Daim 2011). Whatever the factors involved in the choice and adoption approaches implemented by SMMEs, the ability to successfully adopt, integrate and manage new technology lies largely in the evaluation procedures which lay the foundation for successful adoption and integration (Brown & Russell 2007; Cragg, Mills & Suraweera 2010; Love et al. 2005; Rodriguez & Pozzebon 2011). Serafeimidis and Smithson (2000) argue that the evaluation of new technology is often a complex but important part of the organisational process, which involves decision-making. Decisions on new technology by SMMEs are crucial because of the high capital outlay required and the considerable degree of uncertainty applicable to the technology (Love, Irani & Edwards 2004). According to Fitzgerald (1998), decisions on Information Communication Technology (ICT) investment is a difficult process, especially to determine the return on investment. The failure to evaluate and the lack of proper understanding of the implications of adopting a new technology on the business in its entirety, may lead to the adoption of inappropriate technology or the non-adoption of a potential new technology with advantages for business growth (Abulrub et al. 2012; Palvalin, Lonnqvist & Vuolle 2013).

The evaluation process starts from the point of no knowledge or first knowledge to increased knowledge of its features and characteristics, to an in-depth evaluative measurement, which results in an analytical and predictive conclusion (Cowan & Daim 2011; Dyerson, Harindranath & Barnes 2009; Palvalin et al. 2013). From the no knowledge to the first knowledge level a familiarisation of the advantages, implications, constraints, information and potential of the new technology ensues. When knowledge of a new technology has been obtained, the adaptability, applicability, compatibility and capability of the technology determine the decision to possibly accept, adopt and implement the new technology (Dyerson et al. 2009). Thus, non- adoption of technology is often based on the lack of evaluation of the potential and constraints relating to the adoption and utilisation of the new technology (Cowan & Daim 2011; Cragg et al. 2010). SMMEs are predisposed to investing and adopting new technology for the business when it offers them a competitive advantage and enables them to increase their efficiency and productivity rate even though constrained by limited resources (Dalipi, Idrizi & Kamberi 2011). Such a position is only relevant when SMMEs understand the value and ramifications of key decisions that can only be guaranteed by proper knowledge and evaluation of the new technology. A competitive advantage gives businesses a leading edge over competitors, and it is used as a strategic tool to positively bring about organisational change in the business process (Nguyen et al. 2013).

Abulrub et al. (2012) and Cowan and Daim (2011) state that evaluation procedures of technology forecasts need to evaluate each particular technology and SMME according to the individual context or their characteristics. The evaluation incorporates surrounding factors such as environmental, political, cultural, ideological, religious, economic, geographical, organisational and regulatory policies and behavioural tendencies of the business (Landt & Damstrup 2013). The relating relevant factors present must all be taken into account in the evaluation process. The evaluation should be properly investigated, documented and should show the advantages and disadvantages of the potential technology. The result of the projected impact of the new technology on the business, over a set period and range of time, should be clearly stated. Another key factor to take note of is the risk involved in the uncertainty of the future of the technology, although it is generally expected that return on technology should outweigh the risks associated with the adoption (Abulrub et al. 2012; Chan et al. 2012). However, Lee et al. (2010) and Love et al. (2005) state that decisions of owners and / or managers also depend on how much the decision-makers are willing to accept as an equitable risk to balance the level of uncertainty and probability of the outcome, which is relatively unknown. Investment decisions have now been further simplified by the application of risk analysis using financial techniques to support informed investment decision-making processes in the business.

The challenges SMMEs face are linked to the problems that emanated from the non-evaluation of the potential of a new technology before adoption (Chan et al. 2012; Kim & Garrison 2010; Nguyen 2009). As a result of the non-evaluation and non-adoption of new technology, SMMEs forfeit the opportunity to gain a competitive advantage for their businesses regarding increase in growth and efficiency rate and improvement in the quality of goods and services rendered (Boateng et al. 2010; Maryeni et al. 2012; Verhees, Meulenbergh & Pennings 2010). The challenge for SMMEs remains in the lack of adequate resources and proper knowledge needed to obtain the necessary information and data needed for accurate evaluation for the new technology to be beneficial to the business (Chan et al. 2012; Cragg, Caldeira & Ward 2011; Dyerson et al. 2009). To address the problem of non-evaluation of the significance and appropriateness of technology which often leads SMMEs towards practices that ultimately endanger their businesses and places them in precarious situations, the following questions were asked, ‘How can SMMEs evaluate the business potential of new technologies?’ ‘How does the evaluation of new technology affect the decision-making of new technology in SMMEs?’ These questions were aimed at understanding how SMMEs determine technologies suited for the business. And also to find a process to assist SMMEs to evaluate the business potential of new technologies and also to explore the significance and contribution of the evaluation process towards decision-making on adoption of new technologies.
When it comes to small business practice, the practicalities involved require a change in orientation on how evaluation is perceived by business managers, and it requires an understanding of the concept and values of risks analysis and benefit management practices in business (Palvalin et al. 2013; Serafeimidis & Smithson 2000). Contrary to the objection of cost and unavailability or limited resources as main barriers of new technology adoption, studies have recently found the absence of proper planning and evaluation as the main barrier to new technology adoption by small businesses in the USA (Ghobakhloo et al. 2011). Therefore, the more effort is put into a detailed plan and analysis of a new technology, the better knowledge is gained of the potential impact of the technology and its usefulness to the business. New technology adopted with disregard to the factors and relationships that exist within the dynamics of evaluating the new technology jeopardises the potential benefit and realisation of the benefits accruable (Akeke, Ojako & Wainwright 2011). The stages of strategic acceptance as proposed by Abulrub et al. (2012) show key considerations and steps required to evaluate and adopt new technology by SMMEs. Abulrub et al. (2012) state that the stages of initial awareness, personal and/or user acceptance, value cost and risk assessment, strategic acceptance leading to final acceptance and adoption are important considerations for SMMEs acceptance and adoption of new technology for the business. Failure to cover the strategic steps affects the ability to make informed decisions, thus leaving the business vulnerable to danger and challenges.

The Diffusion of Innovation (DOI) and Technology, Organisation, and Environment (TOE) frameworks are the only two prominent technology adoption models that acknowledge the essence of decision-making and elements of new technology diffusion in an organisational context (Oliveira & Martins 2011). The composition of the components of DOI and TOE elements, which describe a suitable approach for adoption decision-making applied in the context of SMMEs in developing countries, lends credence to the relevance of the research study. The TOE theory, developed by Tornatzky and Fleischer in 1990, was proposed to accommodate organisational elements and components that influence technology adoption decisions of a firm. The construct of the TOE framework is based on three contexts, namely: (1) technological – includes both externally available technology and current internal technologies of relevance to the organisational process, (2) organisational – describes the characteristics of the organisation with regard to size, scope of business and management structure and (3) environmental – describes elements pertaining to the business environment, for example physical location, competitors, industrial sector and interaction with government agents. According to Tornatzky and Fleischer (1990) cited by Dalipi et al. (2011:113), the three components of TOE are factors in decision-making for adopting new technology and imply ‘constraints and opportunities for technological innovation’. Therefore, the three influential factors describe the way a business identifies the need for new technology, conducts a search for it and makes a decision to adopt the new technology.

For a business to fully realise the accruable beneficial impact of new technology, the technology must be aligned with the business processes to function appropriately (Palvalin et al. 2013). The alignment between business and IT strategies will improve the functioning of the business and will result in an increase in profits. Despite many adoption models of technology being proposed, there is still a slow uptake of new technology by SMME’s (Oliveira & Martins 2011). There is a lack of planning and evaluation on the side of the SMMEs when adopting or attempting to adopt new technology (Ghobakhloo et al. 2011). The study was aimed at exploring the impact of evaluation and non-evaluation on decision-making process of SMMEs when adopting new technology for the business. A further aim of the study was to contribute in practice to decision-making of SMMEs by proposing a set of guidelines for IT adoption.

Methodology

The research has an ontological perspective with a subjective stance, which connotes that a situation having come into existence does so only through the action of humans in creating and recreating the phenomena observed (Orlikowski & Baroudi 1991). The research is based on an inductive approach because of the need to better understand the problem and to develop guidelines based on the empirical observations to address the identified research problem. The research strategy followed was a multiple case study design with analytical concepts by providing a detailed description of each case within a unit and generally comparing themes across cases (Saunders, Lewis & Thornhill 2009). The units of analysis were SMMEs (15) across the City of Cape Town Metropolis, South Africa. The units of observation were owners and/or managers and decision-makers in the business and technology management sections of their businesses. The SMMEs that were chosen by non-random, purposive and judgemental sampling were all financial service providers (FSPs). The assumption was made that these FSPs must at least have some technology available to them and are using the technology to execute the business processes. Data were collected using an interview guide with a semi-structured questionnaire by means of one-to-one interviews (Miller & Glassner 2009). Interviews were transcribed and given to the participants to verify that the transcription were correctly transcribed and mirrored the intent of the participant. The data were analysed using a simple thematic coding system by reading through all the data extensively, summarising all of the data collected, taking note of all the similarities that occur in the data, grouping key concepts into themes and identifying key themes according to their appearances in groups (Quinlan 2011).

Findings and discussion

Making an informed decision is crucial for the continued survival of the business. Some of the SMMEs interviewed feel that evaluation of new technology could give them an advantage when decisions are made based on relevant facts about the technology to enable them to perform better and
deliver more efficiently in their business. SMMEs need understanding that evaluation of technology gives a better understanding of the suitability of new technology for making an informed decision. The significance of new technology evaluation of the business is described by Palvalin et al. (2013), who stress that failure to evaluate and the lack of proper understanding of the implications of adopting new technology for the business may lead to the adoption of inappropriate technology or the non-adoption of a potential new technology. The value new technology offers the business process is a key influence on the decision of SMMEs to adopt the new technology, as the technology is a strategic tool and key enabler of business objectives and goals.

Small businesses often risk failing because of the impulsive and excessive buying of technology without evaluation for their business processes. SMME managers or owners are often found to base their decision to adopt new technology on speculative and empirical knowledge from their personal judgement, communication preferences and individual experiences. The lack of proper understanding of the implications of adopting a new technology on the business may lead to the adoption of inappropriate technology or the non-adoption of a potential new technology. Small business owners and/or managers often base their decisions on their own perception, intuition, trends, attitudes and experience without much consideration for evaluation and operational needs (Rantapuusa & Ihanainen 2008). As a result, they are often left with a feeling of inadequacy when they adopt the wrong technology and end up losing money, not knowing what they need to solve their problems.

Evaluation of new technology has been said to play an important role in the adoption process. Not evaluating new technology, and the potential it holds for the business could be to the detriment of the business. The lack of evaluation poses a problem because decisions taken consequently are uninformed, biased and usually based on little or no information. A participant of the study states the following:

I don’t think small businesses evaluate properly before adoption. Businesses end up failing due to excessive buying and disregard for evaluation. People often don’t make the right choices because they don’t evaluate the right choice. (Respondent 3)

Lack of proper evaluation of significance and appropriateness of the technology is encapsulated by Palvalin et al. (2013), stating that the failure to evaluate and the lack of proper understanding of the implications of adopting a new technology on the business in entirety may lead to the adoption of inappropriate technology or the non-adoption of a potential new technology with advantages for business growth. Respondent 4 argues that ‘…SMMEs don’t realise the urgency, risks and benefits of having the technology in the first place. The lack of information and proper knowledge causes little drive towards technology’. Respondent 6 recounts the experience of non-evaluation in previous attempts to acquire a new technology, thus resulting in buying the wrong technology:

… we didn’t have the experience or knowledge about the technology. We failed to measure the relevance and significance of the technology at that time. What we thought we needed, didn’t match the requirements of our clients. We were unsuccessful in mapping out what is our desired future in terms of technology. (Respondent 6)

SMMEs usually act on gut feeling and are easily influenced by current trends in the environment without paying attention to the functionality and appropriateness of the technology to their business. Steyn and Leonard (2012) reveal that many SMME owners often seek the assistance of friends, relatives or other SMME owners in the initial process of adopting new technology. Giving the lack of adequate ICT knowledge and limited exposure to new technology from the people consulted for advice, SMMEs do not necessarily adopt suitable technology because of their ignorance of the potential value and use of technology (Abulrub et al. 2012; Palvalin et al. 2013). According to Buonanno et al. (2005), the decision-making for new technology adoption by SMMEs is mostly affected by spontaneous actions, social activities and trends rather than established process business objectives, proper technology enquiry and evaluation processes. SMMEs need to understand that evaluation of technology gives a better understanding of the suitability of new technology, thus contributing towards an informed decision and active engagement in evaluation to assist in making the right and most appropriate choices regarding the business. Respondent 5’s comment encapsulates the case for suitability when he says that SMMEs should go about:

… observing and absolving what is happening around, and then making decisions to see if it is appropriate. There are certain areas where technology fulfills certain criteria, and then it becomes appropriate. (Respondent 5)

Serafeimidis and Smithson (2000) argue that unsuitable technology brings problems of mismatch or poor fit of new technology to the business process. Such misalignment presents considerable risk to the business with regard to operations, and the costly nature of the problem will impact negatively on the business.

Many of the SMMEs in this study failed to identify, evaluate and adopt new technology and have no knowledge of the benefits accruable from the use of the new technology for their business, hence losing the ability to have a competitive leverage over their competitors. The participants were all in agreement that the technology problems they are facing are mostly as a consequence of not evaluating the new technology before adopting for their business. The SMMEs admitted to rather act on gut feeling and trends rather than verified information. SMMEs are prone to impulsive and excessive buying of technology, disregarding the evaluation of the technology for the business and business processes. This finding is supported by the research of Rantapuusa and Ihanainen (2008), stating that SMMEs’ owners and managers often base their decisions on their own perception, intuition, trends, attitudes and experience without much consideration for evaluation and operational needs. Aleke et al. (2011) also
showed that new technology is adopted with disregard to the factors and the relationship that exists within the dynamics of evaluating the new technology. The disregard of evaluation of technologies before adopting the technology for the business often leads to business process failure as the newly adopted technology does not support the processes in place. This creates mistrust and eventually the abandonment of the technology. The misalignment of the new technology with the business goals, objectives and processes results in an ineffective and inefficient business (Serafeimidis & Smithson 2000).

Conclusion and recommendations
The evaluation of new technologies, to a large extent, makes it possible for SMMEs to understand the risks and complications associated with a new technology before adopting it for the business. The importance of evaluating new technology is understood by the respondents in this study. However, it is evident that SMMEs do not have existing structures or formalised directions and steps to evaluate new technology for the business. The knowledge required to understand the functionality of a new technology can only be accessed by asking the right questions about the business requirements, measuring the adaptability, capability, compatibility and applicability of the new technology and creating a synergy of business and technology alignment (goals, objective, strategies and business processes), thus facilitating and fulfilling the impact and resultant expectations the business requires. The knowledge and application of improved and advanced technology gives businesses leverage over other competitors in the market. Therefore, evaluation can be described as a key enabler of business. It enables technology to be seen as a means to an end with the ability to be more efficient and productive, which increases economic development and survival of the business.

Evidence shows that SMMEs do not have the existing structures or formalised directions and steps to evaluate new technology that has been incorporated into their businesses. They have therefore suffered various losses, especially in the early stages of their businesses. Evaluation of technology has been established as a strategic tool to attain business objectives and goals. Making an informed decision on the suitability of new technology and its effective measurement and establishment of key elements and factors such as effectiveness, cost, quality of functionality, benefits accruable and associated risk, amongst others. SMMEs must establish compelling and relevant evidence pointing to the appropriateness of the new technology and its effective utilisation as an advantage over existing technology with fewer cost implications. Evaluation procedures should be carried out in sequential phases to reduce the risk inherent to the adoption of new technology. At the end of each phase, a decision can be made to proceed to the next phase of evaluation to effect adoption of the new technology. The below-mentioned guidelines are developed for SMMEs to assist in the evaluation and decision-making of new potential technology for their business.

The value new technology offers the business process is a key influence on the decision of SMMEs to adopt the new technology as the technology is a strategic tool and key enabler of business objectives and goals. Making an informed decision is crucial to the continuing survival of the business. It enables them to perform better and deliver more efficiently in the running of their businesses. SMMEs need to understand that evaluation of technology provides a better understanding of the suitability of new technology, thus contributing towards informed decision-making to make the right and most appropriate choices regarding the business. The research established that SMMEs find it challenging to make quality decisions about new technology because they often lack ICT expertise and skills, therefore new technology decision-making is often a daunting task for them. Steyny and Leonard (2012) assert that decision-making by SMMEs without the input of a professional exposes the business to failure in the adoption process and jeopardises the survival and growth of the business.

The lack of strategic management skills by SMMEs is made evident by Xesha, Iwu and Slabbert (2014), who declare that half of SMMEs failure in South Africa is as a result of poor decision-making and management capacity. SMME managers and/or owners therefore need to understand the level of maturity of the technology and the value of the potential strategic benefit to the business before a decision is made. The advantage of an understanding of evaluation for managers and/or owners is the ability to make swift, informed decisions which limit the risk of adopting unsuitable and obsolete technology because of lengthy delays caused by uncertainty and hesitation. Therefore, Govender and Pretorius (2015:3) declare that, ‘Knowledge of the environment, the need that the technology will address and the skills required for the use of the technology form the source of management decision-making’. It is obvious that SMME managers and/or owners need to proactively engage ICT evaluation and adoption tools to assist in decision-making about new technology, thus minimising the risks they are exposed to through poor decision-making.

The recommendations provided are to guide policy and practice in business and also to promote further research work. Evaluation of new technology should encompass the measurement and establishment of key elements and factors such as effectiveness, cost, quality of functionality, benefits accruable and associated risk, amongst others. SMMEs must establish compelling and relevant evidence pointing to the appropriateness of the new technology and its effective utilisation as an advantage over existing technology with fewer cost implications. Evaluation procedures should be carried out in sequential phases to reduce the risk inherent to the adoption of new technology. The recommendations are proposed to guide policy and practice in business and also to promote further research. The SMMEs need to determine the goals and
objectives as well as strategies for their businesses. Once this is done, the current business processes need to be mapped against these factors. To follow this mapping is to map the desired state. By doing so, the gaps needed to be filled to reach the desired state, will show. Only at this point, the technology that is required to support the desired processes and systems can be decided on. To make such a decision an evaluation guide or process needs to be followed. The proposed guidelines could assist SMMEs in their decision-making processes. Once the desired processes and systems are determined, the new technology being evaluated needs to be adaptable, reliably interoperable, compatible and scalable to meet the demands of the business. The technology needs to be able to manage the processes and workload with ease. As the workload changes, the technology should be able to adapt to the required workload. It is also important to understand the level of technical skills required to implement, enhance and maintain the technology. A further recommendation is to take into account the availability of resources to support the technology and the infrastructure needed to run the technology. The ease of training of the employees to operate the systems needs to be evaluated and, lastly, whilst evaluating the new technology a change management strategy should be put in place. These practical guidelines are recommended for proper identification and acquisition of suitable and appropriate technology with relevant application to the business process.

**New technology decision guidelines**

1. Identify the key features and functions of the new technology, including new features added to the current version.
2. Determine the applicability to the business process, industry standards and business environment.
3. Determine the adaptability to the existing business process, current operations and the ability of employees.
4. Determine the capability of the new technology to handle and deliver needed outputs at required times.
5. Determine the standard capacity of the new technology to handle required workload, and accommodate an increased production volume whilst performing at a standard level.
6. Establish the technical skills and knowledge required to properly operate the new technology to deliver optimum output.
7. Determine the availability of technological infrastructure needed to support the new technology operation.
8. Determine the scalability of new technology, that is the ability to handle future estimated volume and growth.
9. When applicable, first test new technology for a period of time in the business environment to determine the technology fit and stability of the business.

It is imperative for SMMEs to create an evaluation culture as part of the business process to ensure informed decisions on the suitability and appropriateness of new technology. The purpose of evaluation is to obtain sufficient knowledge to make an informed decision. The evaluation guidelines will potentially lead to SMME owners and managers making a better choice and decision on the adoption of new technology. SMMEs need to be equipped to make salient and crucial decisions about new technology that will have a large effect on the business. Getting to evaluate and make proper decisions on a proven and standardised process will ensure that SMMEs continue to grow and avoid making ill-conceived decisions that will expose them to various forms of risks that are detrimental to the business. The suitable choice of new technology involves important decision-making processes in an organisation which allows the organisations to derive optimum value from their business processes to improve their position in the market. In conclusion, the statement made by Govender and Pretorius (2015:11), sums it up saying: ‘ICT adoption clearly provides a means for organisations to realise their strategic objectives, but it is not without risks and challenges if adopted inappropriately’.

The findings from this study are not generalisable and are only applicable to the SMMEs of the sample in this study. Results have shown the need for SMMEs to be actively aware of their business environments and to take the initiative regarding technology adoption and active usage of technology to promote development and to enhance their sustainability and survival in the market place. Further studies should be directed towards SMMEs of other industries to build a profile of SMMEs for creating a reliable and generalisable evaluation assessment tool to assist in making informed decision on appropriate, current and future new technology for the businesses.

**References**


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