

**THE DESIGN AND IMPLEMENTATION OF AN  
INTERACTIVE IT CONSULTING SYSTEM TO IMPROVE  
PERFORMANCE IN SMALL SERVICE FIRMS**

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**This paper represents cross-disciplinary areas of Business; more specifically Small  
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## **Abstract**

The small business (SB) sector plays an extremely important role in the South African economy; this role of the SB sector is prevalent within economies globally. Unfortunately, many small firms experience failure within the first three years of existence and face intensification of competition that requires increased productivity and flexibility. Information Technology (IT) can be implemented into the SB environment to provide critical information, increase productivity, overcome failure and gain a competitive edge. Small firms have implemented IT to a relatively large degree however the optimal utilization thereof within this environment is not prevalent. This paper describes an intervention that was designed to facilitate the effective integration of IT into the small business through the combination of management principles and a well-planned optimal use of IT. Evidence indicates that as a stand-alone tool the intervention is an effective and efficient practical methodology to facilitate the integration of IT into small business. The degree of successful integration is evident in performance escalation that occurred within the SB.

# **THE DESIGN AND IMPLEMENTATION OF AN INTERACTIVE IT CONSULTING SYSTEM TO IMPROVE PERFORMANCE IN SMALL SERVICE FIRMS**

## **1 Introduction**

The small business (SB) sector plays an important role in and provides a valuable contribution to economic development of not only South Africa, but in fact to economies globally. Research indicates the following:

- South Africa: SB comprise 98% of total business, account for 53.9% of formal private sector employment and contribute 34.8% to the total domestic gross product in 2001 (South Africa. Department of Trade and Industry 2001).
- United States: 91.3% (18.1 million) of businesses are small firms accounting for 56.7% of GDP and 56.5% of total small business employment (Carland, 1992:7).
- Australia: 95% of private sector businesses are small, employing 48% of the workforce (Australia. Bureau of Statistics, 2001:8127).
- Europe: More than 90% of business is small which accounts for 25% of the European Union turnover (Dutta & Evrard, 1999:239).

However, despite these dynamics of the SB sector, small businesses exhibit high rates of failure within the first three years of existence. These failure rates are due to external and internal factors. External factors are related to a hostile environment containing legal and regulatory constraints, a limited access to finance and operating within a global environment characterized by intensified competition (De Villiers, 1997:82; Goodall, 2000a:15 and Goodall, 2000b:2). According to Gaskill, Van Auken and Manning (1993), Pickle and Abrahamson (1990) and Scarborough and Zimmer (1994), internal factors include the following:

- Managerial incompetence, which encompasses the following:
  - A lack of management expertise and skills.
  - An inability to exercise good decision-making.
  - An inability to comprehend and integrate strategic and operational management practices.
- Lack of Managerial Experience
- Inadequate Planning
- Poor Financial Control and Record-Keeping

Information Technology (IT) can be implemented into the SB environment to provide critical information, increase productivity, overcome failure and gain a competitive edge. However, despite a high degree of IT usage by SB, the SB owner-managers fail to adopt IT as effectively as the larger businesses do and, therefore, fail to exploit the benefits to the extent that they should. The reasons for this include:

- An inability to analyse processes and/or systems that make a business work.
- A lack of a general knowledge of IT.
- A lack of expertise to computerize the SB.
- A limited access to and ownership of financial resources.
- A reliance on outside sources to assist in the SB computerization process.
- There is the sub-optimal use of IT through the non-identification of the information needs of the business, resulting in the mismatching thereof to IT requirements.
- Finally, a lack of a formal, affordable means to assist in the decision-making process as to what IT to use where, when and how within the SB environment.

Research indicates the existence of a positive and significant relationship between the capabilities of IT and the effective adoption thereof and firm performance; profit ratios were higher, operating expenses to sales were lower, there was a reduction in client debts and improved access to information (Bharadwaj, 2000:186 and Dun & Bradstreet cited in Doescher, 1999). Other studies indicate that systematic and greater planning sophistication has a positive effect on the financial performance and success of the SB (Gaskill *et al.*1993:23; Kent, 1994:47; Robinson & Littlejohn, 1981:47 and Rue & Ibrahim, 1998:32).

Given the importance of the role of SB, there is a need to address the inability of many small firms to adopt IT effectively. The main purpose of this paper is to describe an intervention, the Interactive IT Consulting System (hereafter referred to as CONSIT), which was implemented into South African small businesses to facilitate the effective integration of IT into the small business and the outcomes of the use of that intervention as part of a larger study which aimed to develop solutions for the successful adoption of IT by SB.

## 2 Background

The problem relating to the successful use of IT by SB and how it can be addressed by intervention is better understood through a brief consideration of the nature of the SB management practices, effective IT implementation and consulting.

It is part of the nature of the SB owner-manager to think and create ideas induced by their entrepreneurial spirits, but those ideas and creative thinking then require conversion into plans and strategies. Planning is a task seldom undertaken by the SB (Orpen, 1985:2; Orser, Hogarth-Scott & Riding, 2000:47; Shrader, Mulford & Blackburn, 1989; and Van Auken & Sexton, 1985:7). Planning is also the most difficult of all the management activities to undertake, since it involves a relatively high degree of uncertainty and an elaborate process of strategic and short-range planning. Whilst there are suggestions that the simplification of the planning process to suit the SB needs will encourage participation in this vital function (Jones, 1982:15; Robinson & Littlejohn, 1981: 47 and Scarborough & Zimmer 1993:83), the literature does not seem to contain any functional mechanism or model to promote planning in the SB environment.

The adoption of IT is defined as the using of computer hardware and software applications to support operations, strategic activities, management and decision-making in the business (Lee & Runge, 2001:44). The following factors affect the degree of success of the IT adoption in the SB:

- The **owner-manager** is the main decision-maker and thus has considerable influence on IT usage. Research shows that a positive attitude toward successful IT adoption is fostered through the owner-manager holding a suitable level of IT knowledge, thus increasing adoption rates. (Delone, 1988:56; Lee & Runge, 2001:58; Palvia & Palvia, 1999:129 and Thong & Yap, 1995:430).
- **Organisational characteristics.** The flat, flexible organisational structure of the SB accommodates IT adoption; however, financial constraints, time, and a lack of adequate management and specialized IT knowledge and skills will impede adoption. Financial constraints result in the selection of low-cost solutions that are inadequate for which they were intended.
- **Hardware and software selection.** There is considerable technology in the market place to choose from and to compound the situation, it changes constantly.

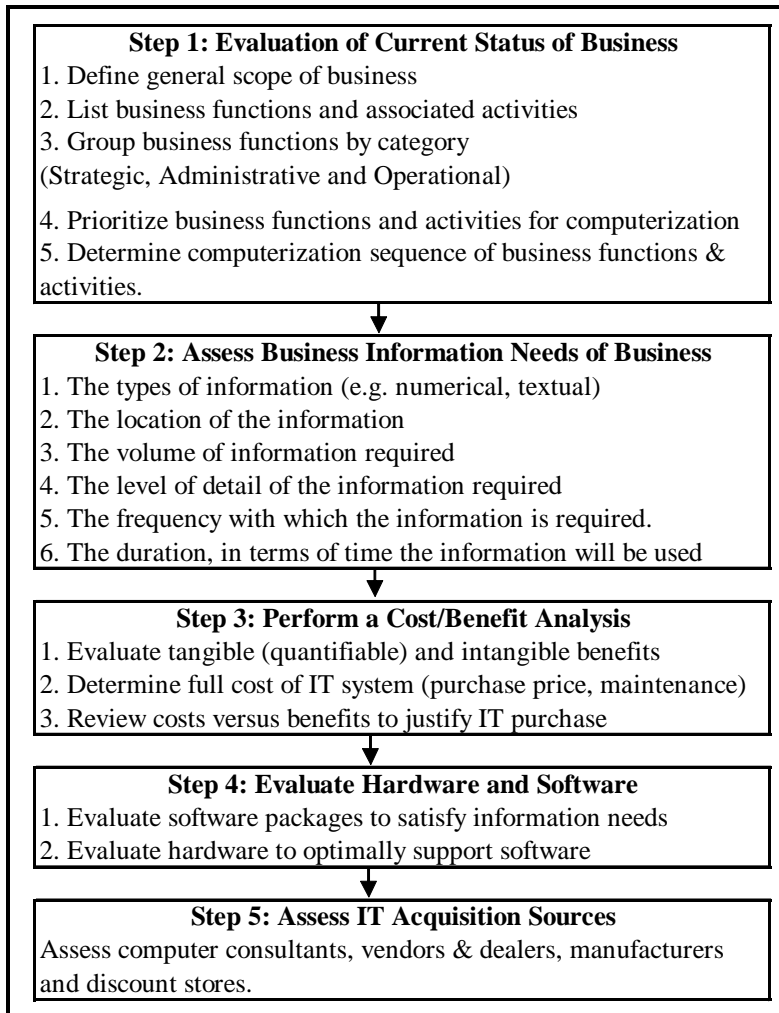
With little or no time to shop around, IT selection occurs almost blindly and equipment is not bought from reputable vendors. The hardware is chosen before the software leading to insufficient hardware capabilities to support the software. Off-the-shelf software packages, which are quickly available, are selected to “fix the problems” instead of applying a well-planned approach to purchasing relevant and beneficial software, which serves particular information needs.

- **Inadequate planning for IT.** Research confirms that careful planning prior to computer acquisition is not exhibited within the SB (Farhoomand & Hrycyk, 1985:22; Lees & Lees 1987:13; Roberts & Senia, 1998:5 and Schleich, Corney & Boe, 1990:8). This negatively impacts IT adoption, inhibits the maximum exploitation of IT and in the absence of formal business planning prevents the successful purchase of IT to adequately support the business on its’ future path.
- **Poor external quality support.** The lack of IT knowledge within the SB leads to a high demand for consultants, computer vendors and technical support when selecting and acquiring IT, but the lack of financial means determines the quality level of such external support. The reliance on external expertise for computer selection often exposes the SB to risks of incompetence, product bias and poor maintenance support.

The literature contains many variations of a process for IT acquisition, most of which follow a sequential approach, but that inhabit a theoretical format rather than a practical tool for SB utilization (Farhoomand & Hrycyk, 1985:21; Fink, 1998:252; Geisler, 1992:79; Lees & Lees, 1987:13; Mahmood, 1982: 22-24; Pickle & Abrahamson, 1990:319; Scarborough & Zimmer, 1994:443 and Williams & Spaul, 1991:388-390). The expertise necessary for SB computerization is quite broad in nature and can be viewed as commencing with the acquisition of computers by the SB, an area where few SB owners are skillful.

In order to develop a system which would facilitate the integration of IT into the SB, the design of CONSIT took into account the nature of the SB in terms of the characteristics in its approaches to management, and what theoretically constitutes management. Thus CONSIT places an important emphasis on planning. Further, CONSIT’s design had to address issues surrounding the SB adoption of IT and provide a process for IT acquisition. The design therefore, included a systematic approach to IT acquisition; a

standard recommended procedure that the SB can follow when purchasing IT, see Figure 1.



**Figure 1 IT Acquisition Process**

To understand the actual needs of a small firm that wishes to adopt IT, the design of CONSIT had to incorporate consultation techniques which took into account the different types of consultants, the role of consultants, the nature of the client-consultant relationship, the interaction of consultants with small firms and consultation as an intervention technique.

The design of the intervention also incorporated the results and findings from a pre-test questionnaire, and to this end a brief review of the research methodology employed in the larger study is warranted.

### **3 RESEARCH METHODOLOGY**

The basis for the research design and methodology used for the larger study was the model of Intervention Research (IR), more specifically the intervention design and development facet (D&D). IR produces two products, namely a knowledge product in the form of research data that defines the problem of interest, and a practical product (intervention) that may be a technique or program; the latter is applicable to this study. While no particular research technique is utilized in D&D, a combination of the qualitative and quantitative modalities was used.

#### **3.1 Research Design**

The quasi-experimental comparable pre-test, post-test, two-group design, where one group is the treatment group and the other the control group, was utilised. The design is a one-way design studying the effect of just one independent variable (IV), where the researcher selects two or more levels of the IV and compares the average performance of the subjects in treatment. For the purposes of this study, two levels of IV were selected, which was the exposure to the intervention versus no exposure to the intervention. All participants in the study received the pre-test evaluation. Thereafter random assignment to the two groups occurred. The treatment group (10 participants) was then exposed to the intervention, while the control group (15 participants) was not exposed. All the participants were then tested (post-test evaluation) again. Finally, the survey methodology was employed, since it was the most economical and efficient method for the purposes of the study.

#### **3.1 The Participants**

Research statistics indicated the number of small firms spread over the nine provinces in South Africa operating within diverse sectors to be 1 065 494 as at 2001 (South Africa. Department of Trade and Industry, 2001). To base the study on all SBs' was deemed to be too vast, hence small business service-based firms provided the focal point. Furthermore the population of participants was restricted to the Gauteng Province of South Africa where the density of small firms are the highest (approximately 352 250); the small-firm business service population was identified as approximately 6% or 21 135 firms. In determining what constitutes an SB, the South African National Small Business Act 102 of 1996 was consulted and the following cut-off criteria as applicable to the business service sector were used (South Africa. National small business act 1996:20):



- ❖ The total full-time equivalent of paid employees is fewer than 50.
- ❖ The total annual turnover is less than R 3-million rands.
- ❖ The total gross asset value excluding fixed property is less than R 600 000 rands.

These criteria therefore indicate that micro, very small and small businesses were included in the study in terms of the above criteria.

The probability sampling method of simple random sampling was selected. There were two sampling incidences present in the study. The first was the selection of participants for the study. The second sampling incidence involved the random assignment of respondents to the treatment and the control group.

### **3.2 Instrumentation**

A self-designed questionnaire was used for the pre-test and the post-test in the study. A fully structured technique was employed in the design of the questionnaires to complement the nature of the SB environment, but also to facilitate data analysis to promote objective and efficient scoring. A semi-structured format however, was applied through the inclusion of a limited number of open-ended questions and the “Other – please specify” multiple choice format option, to ensure the receipt of qualitative and quantitative data. In the absence of a mailing list, which also has a low response rate, the questionnaire was personally delivered to the participants. The instrument is predominantly self-administered so that completion thereof could occur by the participants in their own time. This enhanced the honesty of the answers and ensured a reasonable response rate (39.54%). The researcher did however, exercise caution in the preservation of the ecological validity of the experiment with regards to experimenter bias.

## **4 CONSIT: An Interactive IT Consulting System for Small Business**

The literature and the pre-test questionnaire referred to previously, indicated that the design of the CONSIT system would need to reflect:

- ❖ The nature of SB as an entity and the owner-manager. Small firms require a simpler approach compared to their larger counterparts; CONSIT had to be applicable and suited to the SB.
- ❖ The details of the information facilities to be provided by the intervention.
- ❖ General requirements that include the size and format of the system.

CONSIT was developed to cater for those businesses that do and do not currently use IT. From the outset it was determined that CONSIT needed to be available in a hard copy (book format) and a software program. This software program was constructed using Visual Basic (VB) Version 6.0 (Enterprise Edition) because of its ability to generate customized professional-looking applications and components for the Windows Operating System that those with minimal computer skills can use.

The development of CONSIT commenced with the identification of the system requirement specifications. These specifications assisted in the creation of the conceptual plan, which specified the general form of the intervention. The concept concentrated on the logical relationship between the parts of the proposed system. The concept was illustrated with the utilization of a system flowchart (see Figure 2), was developed from top to bottom, using arrowheads to represent direction.

The nature of CONSIT is that it encourages interaction from the user. To achieve this, each of the six phases and its sub-systems consist of pre-formatted forms or worksheets that request information from the user, in order to provide a recommendation. The worksheets are available either as a printed copy or as a VB screen. Each phase consists of tasks that the user needs to complete on the worksheets and therefore, the way CONSIT operates is as follows:

- ❖ CONSIT presents an objective (purpose) for each of the phases for perusal by the user before commencing with a particular phase.
- ❖ A presentation of the list of tasks requiring completion belonging to each phase is given.
- ❖ The user completes the tasks.
- ❖ Based on the information obtained from the completion of the various tasks, certain calculations may be required.
- ❖ The results of the calculations are summarised and CONSIT will then provide a recommendation.

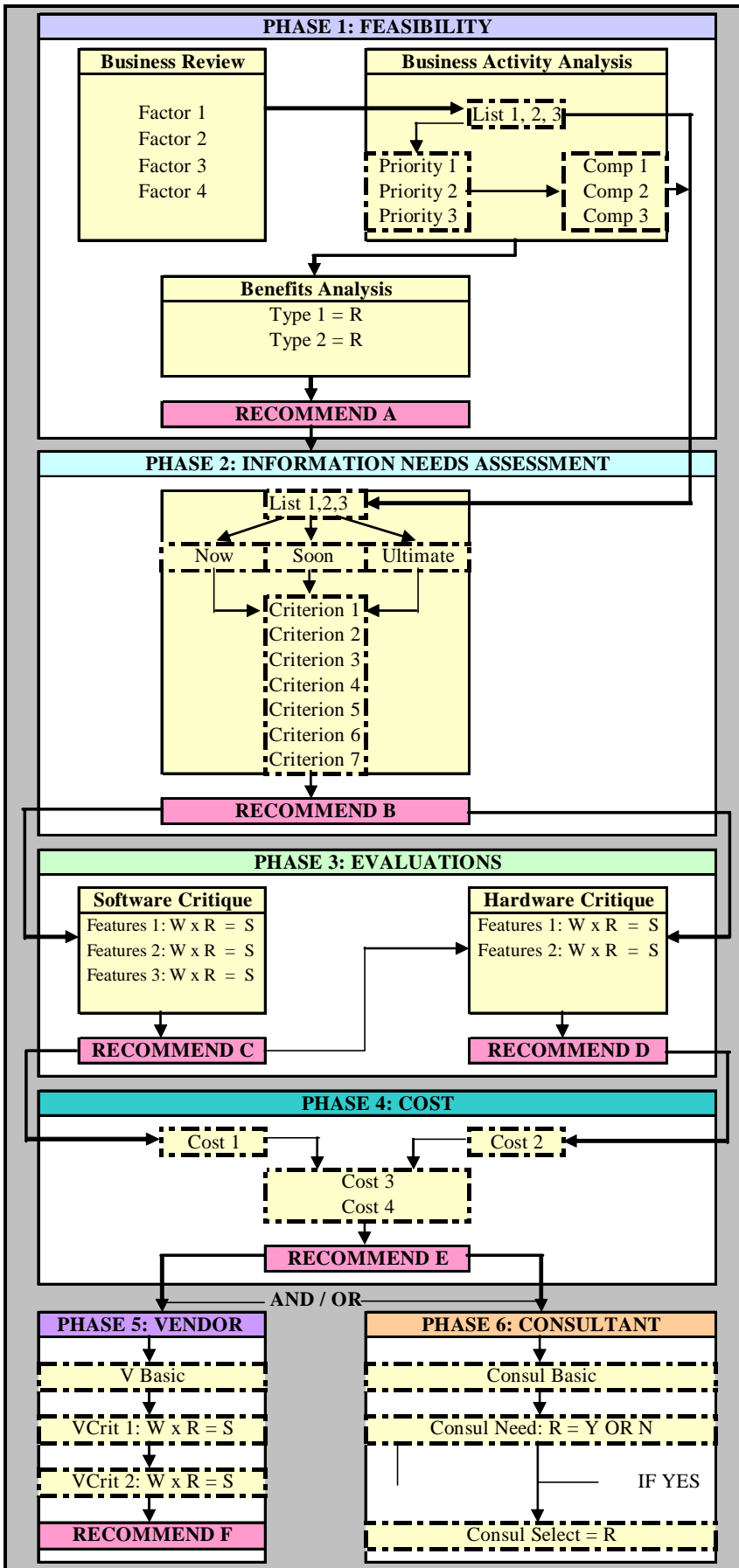


Figure 2 Schematic Representation of CONSIT

Tasks that the user needs to complete will include the submission of:

- ❖ Textual and numerical information that requires recording on a specific task form; the user provides this information. Examples for expected user input are provided where necessary.
- ❖ A pre-determined list of items that need to be checked or ticked.
- ❖ Items that need to be weighted rated and scored.
- ❖ A list of statements that require ratings.
- ❖ Questions that the user should ask vendors and consultants.
- ❖ Calculations.

Finally, CONSIT provides a help function that is available at any time while using the system. This function provides very basic general information about IT with the aid of a glossary that not only defines IT terminology, but also provides hints and general advice regarding hardware, software and any other topic related to the concept of IT.

As indicated in Figure 2, CONSIT consists of six phases; it is these phases that dominate the discussion within this section.

#### **4.1 Phase 1: Feasibility**

This first phase provides an opportunity for the SB owner-manager to carry out a guided feasibility study. This contributes toward the reduction in the levels of managerial incompetence, through the introduction of basic planning skills needed within the SB environment and the integration of strategic and operational management practices that may improve performance levels to combat failure.

- ❖ **A Business Review.** This review essentially encompasses a simplified strategic planning element, but is referred to as a business review to distract the user from the intimidation that planning appears to induce. The review includes a description of the nature of the SB (mission statement), a two-year financial and non-financial objectives listing and a fundamental SWOT analysis for an internal and external SB environmental analysis.
- ❖ **Business Activity Analysis.** This analysis has a strategic, administrative and operational evaluation to promote the integration of these areas for analysis when computerizing the SB. Each evaluation has a listing of associated activities. These activities must be prioritised according to whether they are “essential” (high

level), “desirable” (medium level), and “Nice but can do without” (low level) to the SB. According to the levels of priority indicated, this will in turn assist in determining which of those activities require computerization immediately and/or in the future. This provides a platform for the IT requirements planning.

- ❖ **The Benefits Analysis.** The objective of this analysis is to assess the benefits that relate to the value that computerizing the indicated activities will provide to the SB. The two types of benefits presented are tangible or quantifiable and intangible benefits, IT can add to the SB. This provides the first part of the cost-benefits analysis that the literature review indicated as an important feature of a successful integration of IT into the SB.

This feasibility phase is designed to enable a more effective and efficient use of computers through a detailed evaluation of the business **before** the purchase of expensive computer equipment.

#### **4.2 Phase 2: Information Needs Assessment**

The information needs of the SB can be understood in terms of business information, where the content relates to all facets of the SB. In this phase, the CONSIT user needs to specify what information they need relating to the Strategic, Administrative and Operational areas that were identified in Phase 1. This information relates not only to information for immediate needs but also for future needs. Hence, the objective of this phase is to anticipate the type of business information that the user wants in relation to the activities indicated in the Feasibility Phase. The specification of the information required is as follows:

- ❖ The types of information required, for example numeric, text or graphic.
- ❖ The level of detailed information required, for example, data, reports or listings.
- ❖ The volume and frequency of information needed.
- ❖ The duration of the use of the required information.
- ❖ The location and number of users of the information.

This phase also addresses the problem of sub-optimal utilization of IT resulting from the mismatch of the business needs to the IT requirements.

#### **4.3 Phase 3: Evaluations**

Computer hardware and software suitable for the needs of the business require a thorough assessment before they are purchased. The importance of this assessment lies in the fact

that the components contribute to the optimal extraction and provision of the information identified in Phase 2. It is vitally important to collect information on the software packages that the user thinks is able to fulfill and satisfy the information needs previously identified. Similarly, it is essential to assess the hardware required to accomplish the specific processing requirements of the business in terms of the software evaluated to satisfy the information needs. This phase therefore provides a means by which the SB owner-manager can critically assess the features of the hardware and software components; the software evaluation occurs **before** the hardware to ensure optimal compatibility between the components.

Should the user be selecting the required hardware and software for the first time, this phase provides a systematic manner in which the user can complete the task. If the SB is already computerized it will enable the re-evaluation of the hardware and software components as well as facilitate the purchase of additional components. The contents of this phase enable the solution of the problem of hardware and software purchased by the SB to complete tasks that it is simply not capable of achieving.

#### **4.4 Phase 4: Costs**

Small firms have limited resources especially financial resources. This phase enables the user to compile a budget for any software and hardware that the user might purchase. There are often more costs associated with hardware and software than the actual purchase price such as that of maintenance and training. CONSIT divides the costs into Hardware / Software and Additional Costs. The hardware and software costs consist of the costs related to the most common hardware and software components, for example keyboards, monitors and word processing and spreadsheet packages. The additional costs consist of those items such as accessories and general computer supplies and miscellaneous costs that include important components such as service contracts, training, installation and delivery costs. These costs are then further divided into “One-Off” and “On-Going” costs associated with the financial investment in a complete computer system for the business. It seems that the many “on-going” costs are generally not anticipated when purchasing a computer system.

Generally, it is highly unlikely that the SB owner-manager will employ formalized capital budgeting techniques to assess an IT purchase, hence this phase encourages budgeting and some form of financial planning before the IT purchase occurs. It also provides a cost

analysis as part of the cost-benefits analysis framework previously mentioned; it provides an important tool for the ultimate justification for a computer system.

At this point, the CONSIT user may decide that they need to employ a consultant to assist them with the computerization of their business, in which case they may proceed directly to Phase 6. Alternatively, they may decide that a consultant is not required for the computerization of their SB and will themselves identify a vendor for the actual purchase, in which case they may proceed to Phase 5.

#### **4.5 Phase 5: Vendors (Assessment)**

Small firms experience problems when trying to find expert advice and interacting with vendors that tend to serve their own interests as a priority instead of that of the customer. This phase will assist the SB owner-manager to thoroughly assess a vendor from whom the computer may be purchased. It provides a detailed assessment of the vendor which includes a framework to obtain basic background information on the vendor and facilitates the assessment of their attributes (for example, responsiveness to needs and problems of customers, vendor reliability and so forth) and more importantly, their level and quality of service and maintenance support. The SB owner-manager has a right to know what sort of vendor they are buying their computer from; what seems a “cheap” buy in the first place may not prove so “cheap” in the long run.

#### **4.6 Phase 6: Consultant (Needs Analysis & Assessment)**

The objective of this phase is twofold. Firstly, it assists the CONSIT user to ascertain whether they really need a consultant for the SB’s computerization project, since the services of a consultant can be expensive. Secondly, it provides the user with a thorough assessment of how to proceed with the selection of the appropriate consultant. This part encompasses issues such as the commitment of the consultant to the SB’s computerization project (these projects can be small in comparison to the larger firms), their comprehension of basic small business operations, the level of expertise to accommodate the project and the disclosure of alliances with a computer vendor or manufacturer, to mention a few. The purpose of this phase is to also ensure a thorough preparedness for the arrival of the consultant with regard to clarity about the role and purpose of the consultant and so achieve a collaborative relationship between the

consultant and the SB owner-manager, which produces mutually beneficial results for both parties.

## **5 Indicators of Successful Integration**

CONSIT Interactive and the implementation methodology (based on project management principles) were subject to pilot testing. Full implementation then occurred followed by an integration of CONSIT within the SB environment for use in daily operations. Both experimental groups were then asked to complete a post-test questionnaire. The results and findings discussed in this paper will be limited to the following areas:

- ❖ Financial Performance Factors
- ❖ Provision of Effective Management Principles
- ❖ Degree of IT Knowledge
- ❖ The Sub-optimal Use of IT

### **5.1 Financial Performance Factors**

The application of the non-parametric Mann-Whitney U and Wilcoxon Signed Rank Tests to the data indicated no statistical significant differences between or within the treatment and control groups. Hence, in terms of these results the escalation of performance in the SB after the integration of CONSIT did not occur. However, this does not imply that CONSIT is unable to escalate performance and hence, failed as an intervention in terms of its intended purpose. The results clearly indicated a trend amongst the performance variables, where the mean of the scores for the variables in the treatment group is increasing. The results indicated the following trend:

- ❖ An increase in average annual turnover.
- ❖ An increase in the monthly net operating profit percentage (profit before interest and tax).
- ❖ An increase in gross asset turnover (gross assets excluded fixed property).

No such trend was prevalent in the control group; the results remained unchanged. It could be argued that the trend indicated in the treatment group is due to extraneous variables. Whilst this is possible, due to the nature and rigor of the research design, unlikely.



## **5.2 Overcoming Managerial Incompetence**

The treatment group unanimously agreed (30% strongly agreed and 70% agreed) that CONSIT enabled the integration of strategic and operational management practices. This result is further supported by a strong positive correlation between the improved performance variables and the integration of the above management practices (0.802).

The treatment group were unanimous in their opinion (70% strongly agreed and 30% agreed) that CONSIT facilitated the simplification of the planning process within the SB. Respondents from the treatment group stated:

- ❖ “I really found the business review great. It is almost like a planning schedule, but a very simple one that is easy to do.”
- ❖ “CONSIT made me look at things differently and think about issues such as planning that I generally do not have the time for.”

Support is evident for the finding that the simplification of this essential activity and its renaming changed the small firms’ perception of strategic planning. On the other hand, the treatment group respondents requested additional templates for a business plan and the strategic activities of basic sales and expenditure budgets, and more importantly cash flow forecasting.

IT planning elements contained in CONSIT included a future information needs assessment and a costs evaluation module (a budgeting information for total computer cost assessment). Absolute agreement from the treatment group in support of the costs evaluation module as a budgeting tool and the future information needs assessment occurred. CONSIT therefore, has managerial competency and planning elements that can successfully contribute to the reduction in SB failure.

## **5.3 Degree of IT Knowledge**

The literature indicated that a positive attitude toward the adoption of IT into the SB is enhanced through the provision of a greater degree of IT knowledge to the owner-manager. This in turn will improve the likelihood of IT adoption. While the application of the Mann-Whitney U Test and the Wilcoxon Signed Rank Test to the degree of knowledge variables indicated no statistical significant differences between or within the treatment and control groups; other results show a clear trend in the improvement of the degree of IT Knowledge of the treatment group, see Table 1.

**Table 1 Degree of IT Knowledge**

Degree of Knowledge of Computers	Pre-test Scores			Post-test Scores		
	Treatment Group	Control Group	Total	Treatment Group	Control Group	Total
None	4.00%	0.00%	4.00%	0.00%	0.00%	0.00%
Little	16.00%	12.00%	28.00%	4.00%	12.00%	16.00%
Average	12.00%	28.00%	40.00%	16.00%	28.00%	44.00%
More than average	4.00%	12.00%	16.00%	16.00%	12.00%	28.00%
Extensive	4.00%	8.00%	12.00%	4.00%	8.00%	12.00%
<b>Grand Total</b>	<b>40.00%</b>	<b>60.00%</b>	<b>100.00%</b>	<b>40.00%</b>	<b>60.00%</b>	<b>100.00%</b>
Mean Scores	<b>2.70</b>	<b>3.27</b>	<b>3.04</b>	<b>3.50</b>	<b>3.27</b>	<b>3.36</b>
Std Deviation	<b>1.16</b>	<b>0.96</b>	<b>1.06</b>	<b>0.85</b>	<b>0.96</b>	<b>0.91</b>

Additional results include:

- A strong positive correlation (0.827) between the degree of IT knowledge in the treatment group and the increase in the use of the computers currently used in the existing functions of the business. This indicates that the higher the degree of IT knowledge held by a participant, the more the computers utilisation will increase in terms of the existing functions of the business. The majority of the respondents in the treatment group (85.71%) had average and above average IT knowledge after the implementation of CONSIT.
- A strong positive correlation (0.833) between the degrees of IT knowledge in the treatment group and an improvement in the effective use of the computers currently existing in the business because of using CONSIT.
- Ninety percent of the treatment group respondents claimed that they had gained a greater degree of general knowledge about computers through the utilisation of CONSIT. The entire treatment group agreed that information supplied by CONSIT simplified computer jargon that can be confusing when purchasing computers; this would also have contributed to the increase in the general knowledge of IT.

The finding is therefore, that CONSIT does have the ability to increase the degree of general knowledge of IT in the treatment group.

#### **5.4 The Sub-optimal Use of IT**

The second component required for successful integration is the well-planned optimal use of IT. The optimal use of IT includes three elements; increasing the efficiency of the asset (IT), the integration of strategic and operational variables, and the successful assessment of the information needs of the business. Table 2 and 3 indicate the IT efficiency improvements in terms of hardware and software satisfaction.

**Table 2 Degree of Hardware Satisfaction for the Experimental Groups**

Degree of Hardware Satisfaction	Treatment Group		Control Group	
	Pre-Test	Post-Test	Pre-Test	Post-Test
Highly Dissatisfied	0.00%	0.00%	0.00%	0.00%
Not Satisfied	0.00%	0.00%	0.00%	0.00%
Neutral	14.29%	0.00%	7.69%	7.69%
Satisfied	57.14%	71.43%	61.54%	61.54%
Very Satisfied	28.57%	28.57%	30.77%	30.77%
<b>Total</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>
Mean	4.14	4.29	4.23	4.23
Std. Deviation	0.69	0.49	0.60	0.60

**Table 3 Degree of Software Satisfaction for the Experimental Groups**

Degree of Software Satisfaction	Treatment Group		Control Group	
	Pre-Test	Post-Test	Pre-Test	Post-Test
Highly Dissatisfied	0.00%	0.00%	0.00%	0.00%
Not Satisfied	0.00%	0.00%	0.00%	0.00%
Neutral	0.00%	0.00%	7.69%	7.69%
Satisfied	71.43%	28.57%	69.23%	69.23%
Very Satisfied	28.57%	71.43%	23.08%	23.08%
<b>Total</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>
Mean	4.28	4.71	4.18	4.18
Std. Deviation	0.49	0.49	0.55	0.55

Additional results include:

- The implementation of CONSIT has a strong positive correlation between
  - The degree of hardware (0.982) and software satisfaction (0.985) and,
  - The increased use of the computers currently utilised by the treatment group in the existing functions of their business (0.873) and,
  - Those respondents who made a more effective use of computers that they currently have in their business as result of using CONSIT (0.897)
- All respondents agreed that CONSIT enabled them to comprehensively evaluate the computer hardware and software that may suit the needs of their business prior to purchase.

The implementation of CONSIT into the SB increased the use of the computers (an 86% increase) that the SB currently employs in the existing functions of the business. CONSIT thus had an effect on the increased efficiency of IT.

CONSIT has provided information that introduces strategic variables to the SB to promote the integration of strategic and operational issues when utilising IT, since the strategic variable contributes toward growth and improved performance. All the respondents agreed that CONSIT enabled them to integrate, strategic, administrative and

operational management practices. A strong positive correlation (0.802) between the ability of CONSIT to equip the SB to optimise the use of computers in their businesses leading to improved performance as well as the ability of CONSIT to integrate strategic, administrative and operational management practices supports this. Finally, this integration will not only solve a part of the managerial competency problem, but also lead to a more optimal use of computers within the SB.

CONSIT has enabled the comprehensive assessment of the business information needs and promoted the matching of those needs to the IT requirements. All respondents in the treatment group agreed that CONSIT provides a formal means to assess the present and future information needs of their businesses. Ninety percent of the respondents agreed that CONSIT enables the SB to better match its business information needs to the computers it already has or requires. The remaining 10% of respondents had expressed uncertainty. However, this group had an extensive degree of IT knowledge and had already made extensive use of computers in the management of the business.

The finding therefore, is that CONSIT did promote the optimal use of IT in the SB and the SB did begin to optimally utilise IT due to the implementation of CONSIT. Responses from the treatment group also support the finding:

- ❖ “I get more use and value out of my IT investment and I invested in more to substantially improve the way we work.”
- ❖ “I can start seeing some return on all the money I have spent on my computer.”

## **6 Conclusion**

Small businesses are not miniature large businesses; they must be viewed as unique entities with unique needs that require unique solutions. A rigorous analysis of the literature provided a sound theoretical platform for intervention design activities. The design and development of CONSIT considered the inherent characteristics of small business and the needs of the owner-managers. This intervention research has successfully bridged the gap from the conceptual design to the finished product. The intervention was implemented and infused into the SB environment with the objective of achieving successful integration of IT into the small firm. Evidence indicates that as a stand-alone tool, CONSIT is an effective and efficient practical methodology to facilitate

the integration of IT into small business as it provides a viable solution for the specific problems experienced by small businesses highlighted in the paper. The researcher is of the opinion that the integration of CONSIT into the SB for a longer period of time will enable a more significant degree of successful integration in the form of performance escalation. A study participant supported this belief in their statement that: “CONSIT is an excellent tool in the small business market to promote the use of computers in the day-to-day management of a business.”

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