

https://dspace.org/

Examination of benchmarking practices in South Africa firms

Smart, Daniel Arthur John

2014-04-03
http://hdl.handle.net10539/14483

Downloaded from a DSpace repository. https://dspace.org/

EXAMINATION OF BENCHMARKING PRACTICES IN SOUTH AFRICAN FIRMS.

Daniel Arthur John Smart

A Research Report submitted to the Faculty of Commerce, University of the Witwatersrand, Johannesburg, in partial fulfilment of the requirements for the degree of Master of Commerce.

Johannesburg, 1998.

DECLARATION

I hereby declare that this research report is my own, unaided work.

It is being submitted in part fulfilment of the requirements for the degree of Master of Commerce at the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in this or any other University or Educational Institution whatsoever.

_____
Daniel Arthur John Smart

this _____ day of _____ 1998
Johannesburg.

I would like to express my deep appreciation to my supervisor, Brian O' Donovan, for his guidance and advice. I would further like to thank my girlfriend, Frances Homan, and my family for the support and consideration they afforded me during the research and writing of this research report.

CHAPTER 1. INTRODUCTION 4

1. INTRODUCTION 4

2. RESEARCH PROBLEM DESCRIBED AND QUESTIONS POSED 5

CHAPTER 2. BENCHMARKING 8

1. THE EFFECT OF COMPETITION ON THE FIRM 8

2. COMPETITIVE ANALYSIS 9

3. BENCHMARKING 11

4. KEY ATTRIBUTES 14

CHAPTER 3. RESEARCH METHODOLOGY 21

1. INTRODUCTION 21

2. OPERATING CIRCUMSTANCES OF FIRMS SELECTED 21

CHAPTER 4. THE EMPIRICAL TESTS 24

1. MANAGEMENT'S RESPONSES AND SPECIFICS OF THE SOUTH AFRICAN ENVIRONMENT 24

2. SUGGESTIONS TO FOLLOW UP RESEARCH 36

CHAPTER 5. CONCLUSION 37

REFERENCES 38

CHAPTER 1. INTRODUCTION

1. INTRODUCTION

Whilst contemporary managements are concerned with the measurement of the performance of their businesses, they now recognise that "new strategies and competitive realities demand new measurement systems" (Eccles, 1991). There is a need for management techniques to provide strategic management information as well as operational performance measures. This requires a balance between measuring actions already taken and drivers of future performance (Kaplan & Norton, 1992).

In response to the pressures placed on management by market and consumer trends, locally and globally, numerous management techniques have been introduced in an attempt to improve the competitive performance of business in the delivery of products and services to customers (Watson, 1993). Many of these have been oversold as being universally applicable to business whereas they have a limited business application. The net result of this onslaught of techniques is that senior management has become sceptical of those claiming to revolutionise the way to do business. The consequence is that management is reluctant to apply current techniques, but continues to use historical management tools that have been found reliable.

One management approach, which continues to be extensively used, is competitive analysis. In the past, this has provided a powerful tool for strategy formulation (Walleck *et al*, 1991). It has enabled management to determine differences in key quantitative and qualitative measures between the firm and its competitors. The process, however, has only enabled a quantification of these competitive gaps in performance. As no analysis of the underlying reasons for the gaps was performed, the result was a management tool that was useful for performance measurement but had limited applications for strategic management. Hence, pure competitive analysis has restricted application as a contemporary management tool. Any management information derived from a competitive analysis would be ascertainable from the

application of a benchmarking process. This is possibly due to benchmarking including, but not being limited to competitor firms as a source of comparisons.

Benchmarking is a relatively modern management process that has captured the interest of business, both as a performance measure and for strategic management. Benchmarking principles are however, not entirely new to business, but are rather a refinement of pure competitive analysis (Mooney, 1995). This view appears to suggest that benchmarking is a natural progression from traditional competitive analysis; an evolution into a superior management tool.

Due to benchmarking being a natural progression from competitive analysis, it has comparable conceptual methodologies. These similarities have influenced the acceptance of benchmarking as a new management tool. The fact that benchmarking at first appears to resemble pure competitive analysis (which most managers are familiar with) has enabled management to identify with benchmarking. The effect is that management is not opposed to implementation of benchmarking programmes (Watson, 1993). It is contended that this is the most important factor responsible for extent of use of benchmarking internationally and the continued growth of benchmarking applications in firms. This link between competitive analysis and benchmarking is further discussed in the next chapter.

2. *RESEARCH PROBLEM DESCRIBED AND QUESTIONS POSED*

Benchmarking will be relevant to South African businesses as new markets open up and local firms are forced to compete internationally. Benchmarking will enable South African firms to understand how international quality standards and production efficiencies can be achieved (McCarthy, 1996). It will facilitate the identification by South African firms of the practices employed by performance leaders to achieve their leading performance (Malcolm, 1997).

There is a comparative lack of literature studying the South African understanding and application of benchmarking. It is apparent from discussions with persons within various consultancy firms, that the benchmarking conducted by the majority of South African companies has achieved varying success rates. A large number of projects has been abandoned. It would appear that there are reasons for these occurrences. It is proposed that the main reason is a lack of understanding of the concept of benchmarking. This in turn affects the ability of management to plan, implement and evaluate a successful benchmarking process. This will lead to management losing faith in a concept capable of delivering invaluable strategic benefits.

The purpose of this research is, therefore, to identify any misunderstandings which businesses have of the process of benchmarking; misunderstandings that could be detrimental to the success of any benchmarking programme undertaken. The research will also identify any factors peculiar to the implementation of benchmarking in South African conditions. The emphasis will be on the identification of the aspects of any benchmarking process which are required for the process to be a success. The main contributing reasons for both successes and failures in the use of benchmarking in South Africa will also be explored.

This research will be based on the key attributes of a benchmarking programme which are required for the programme to be a success. Key attributes are the factors critical to the success of a benchmarking programme. The key attributes of a benchmarking programme can be compared to 'critical success factors' required for the success of a business operation. 'Critical success factors' were originally defined as:

> "...the limited number of areas in which results, if they are satisfactory, will ensure successful competitive performance for the organisation. They are the few key areas where 'things must go right' for the business to flourish" (Rockart, 1979).

This research is aimed at evaluating the practice of benchmarking in South Africa and it is anticipated that it will facilitate in answering the following:

1) To what extent are South African firms complying with the identified key attributes?

The research will identify, from international literature, the attributes commonly accepted as key to the successful implementation of a benchmarking programme internationally. These will be set up in a model or framework, which will be used to establish the extent of compliance by South African firms. The success of the firms' benchmarking programmes will be the extent of fulfilment of the managements' expectations of the programmes.

2) What are the reasons for departures from the key attributes?

The South African economy does not represent a typical first-world economy therefore, companies will be subject to forces not anticipated by international practitioners. It is hence expected that firms will be unable to adhere strictly to internationally identified key attributes. For each of the firms investigated, the reasons for the deviations from the identified key attributes will be investigated. This analysis will also involve a study of those attributes which deviated from the key attributes and the extent to which these contribute to success or failure. This study will also identify which of these attributes can be attributed to the South African environment.

This research report will proceed as follows. The effects of competition on the firm will initially be discussed. Within this discussion, the effect of industry competition will be accentuated. Competitive analysis will then be introduced as a traditional management technique applied for operating comparisons within industries. Benchmarking will subsequently be introduced, the phases to benchmarking described and the practices discussed.

CHAPTER 2. BENCHMARKING

1. THE EFFECT OF COMPETITION ON THE FIRM

A firm's profitability cannot be achieved in isolation of the environment in which the firm trades. Hence, the characteristics of the industry in which the firm operates and the position of the firm within that industry will influence the firm's profitability. Assuming that all firms operate with the ultimate goal of increasing shareholder wealth, the characteristics of the industry will have a decisive effect on the firm's operating strategy.

Although industry competition does affect the profitability of the firm in the South African microcosm, this cannot be seen as the only competitive force on the firms. As globalisation continues and trade barriers are removed, South African firms are being subjected to global competition. In an attempt to improve their market size, international firms are penetrating the previously closed South African markets. Such competitive threats to local firms require distinct consideration in the firm's strategy formulation.

The result of globalisation is that South African firms are under competitive attack from both local and international competition. They have to adjust rapidly from an era when tariffs protected firms from undesired international competition. The result are new and redefined markets requiring firms to be flexible to survive. However, these changes cannot only be seen pessimistically, as they will also provide opportunities for firm to expand beyond the previous industry boundaries.

Historically, South African firms operated within a closed environment. Hence, the local industry competition represented the base against which firms could assess their own performance. Now, however, South African firms should no longer merely assess performance via competitive analysis within an industry in one country; they are now part of a global market and should assess performance against competition globally.

This is where South African firms generally fall short. In the 1996 World Competitiveness Report, South African firms were placed 44th among the 46 nations analysed (Manning, 1997). South African firms need a process that can identify the most competitive firms globally and enable identification of the reasons for these firms being the leading firms in their industries. It is proposed that benchmarking is the management technique that can deliver this information to management.

In response to the competitive environment affecting the firm, the firm will select one of three overall competitive strategies. Porter (1980) has identified these three as:

1. Cost leadership - a continuous effort by the firm to drive costs below those of the competitors.
2. Differentiation - the firm offers value-added services or goods for which it charges a premium.
3. Focused segmental - the firm concentrates on a particular market or sells a specific product range.

Once management has identified which of the three strategies it believes will enable it to compete effectively, the next step is to identify where the firm is positioned in relation to its competitors. This can be performed by a detailed competitive analysis.

2. COMPETITIVE ANALYSIS

The aim of competitive analysis is to identify how the firm can best compete with its competitors. Competitive analysis thus involves the firm dissecting an industry in which it operates or intends to operate, to assist in formulating strategy.

Walleck *et.al* (1991) identified that competitive analysis is usually conducted in three independent streams:

1. Reverse Product Engineering - the identification of product designs and costs, and technologies used in production,
2. Financial Analysis - the identification of other competitive information which is publically available (e.g. resource allocations), and

3. Field Work - the conducting of interviews with third-parties to corroborate information obtained.

These three streams of analysis are usually combined and cross referenced to obtain one overall view of the industry and the firms operating therein.

Each of the three streams of competitive analysis identified above, have a pitfall in that they do not always stimulate improvement at the operational level (Boxwell, 1994). Although top management may drive proposed operating improvement, as identified by competitive analysis, the operational employees must 'buy-in' to the improvements. Since the operations level is where the firm's competitive strategies are converted to reality, a lack of support for a strategy at operations level will result in no positive effect on the bottom line.

Competitive analysis represents one method of current performance assessment and management should not rely on one measure to the exclusion of any alternatives, particularly when strategic decisions are involved. A similar *caveat* was noted by Walleck *et.al* (1991) in that:

> "...detailed competitive analysis...can actually delay managers from coming to grips with the root causes of inefficiency, waste and lethargy, and can even lead a company off in the wrong strategic direction."

Competitive analysis has limited application in strategy formulation. Information derived from competitive analysis is often dated. Hence, it may differ from the current operating realities in which the target firm now operates. This analysis is however useful as a starting point. Nevertheless, by breaking away from solely an analysis of the competition, the firm exposes itself to operational improvements previously not thought possible. Operating changes can result in fundamental improvements which allow competitive advantage in the medium to long term.

3. BENCHMARKING

A. Definitions of Benchmarking

A formal definition of benchmarking, still regarded as definitive, is that cited by Camp (1989):

> 'Benchmarking is the continuous process of measuring products, services, and practices against the toughest competitors or those companies recognised as industry leaders.' (p. 10)

The main aspects of any benchmarking definition include:

1. A continuous process:
   The crux of this definition is firstly that benchmarking is a continuing exercise and should not be seen on a project basis. If benchmarking is seen as a once-off process, benefits resulting from the improved performance will result only in a temporary competitive advantage.
2. Identification and implementation of best or significantly better practices that lead to superior competitive performance:
   The benchmarking process attempts to determine not only what the industry leader is doing, but also to identify the underlying factors that lead to the leader's superior performance and successful implementation. Through merely emulating the industry leader, the firm may be able to match the performance levels of the industry leader, but it is unlikely that it will enable the performance to be surpassed (Shetty, 1993).

   Ohinata (1994) emphasises this and refers to the underlying benefits of benchmarking:

   > "...ceasing to follow a mere copycat strategy which simply assimilates the results of best practice and starting instead to assess the factors that produce the best practice, in order to extract the driving force which increases customer and employee satisfaction."

   The best or significantly better practices are those practices, products or strategies

that are considered to be the best in a class - or at least better than the firm's current position. The class, against which the practice is considered best, is dependent on nature of the target firm in the benchmarking programme. The target firm could be an internal department or fellow subsidiary; a local or international competitor or a local or international firm in an unrelated industry. Only practices that are better than the firm's current practice should be investigated. The mere fact that the practice is different does not imply that it is better (Karlöf, 1995).

The net result of benchmarking is that management is able to look beyond the product (the emphasis of competitive analysis) to the underlying operating and management skills that produce the product (Walleck *et.al*, 1991).

B. Benchmarking Compared to Competitive Analysis

It is submitted that the differences between benchmarking and competitive analysis relate to:

1. the subject of the analysis,
2. the effect of the analysis on the firm's operations.

1. The Subject of the Analysis:

In competitive analysis, as the term suggests, the analysis is limited to those firms considered competition. These competitor firms will generally be within the same industry as the analysing firm.

Walleck *et.al* (1991) considered that competitive analysis results in a firm becoming a prisoner to its industry. By a firm focusing only within its industry, the firm may unwittingly accept operating and strategic constraints fabricated by the industry:

"Members of an industry attend the same conventions, read the same publications, and develop their own language.... Companies poach each other's people, or recruit from universities and technikons which provide the same

> 'discipline'.... Training programmes embrace the same subjects and 'industry standards' determine who passes...Industry paradigms are created, then enforced" (Manning, 1997, p. 115).

The danger in a pure intra-industry analysis is that a firm cannot expect to gain a true competitive advantage if its aim is only to be as good as its toughest competitor (Hayes and Pisano, 1994). Benchmarking however, aims at measuring the underlying performance of those firms which have the best operating practices, products or strategies. This implies that the subject of the benchmarking analysis is not limited to firms within the same industry or country. The subject of benchmarking is hence the best practice, and who is performing this best practice is not of consequence. The best practice could even be within the firm, just in another division. This provides scope for operating improvements that will translate into competitive advantage.

2. The effect of the analysis on the firm's operations.

The mere identification of a performance gap between the firm and its competitor (or superior performer) does not affect the firm. It is only by translating the knowledge obtained into improved operational performance that the superior performance can be attained or even surpassed. Competitive analysis usually does not provide management with first-hand information to enable operating improvements (Walleck *et al*, 1991).

Benchmarking however, focuses on the underlying processes and practices and not just the quantification of the superior performance in financial terms (Shetty, 1993). The focus on the reasons for the superior performance allows management to adapt the knowledge obtained to the specifics of the firm. This enables the superior performance to be surpassed, a result impossible if the superior performance were merely emulated. By surpassing the superior performance a true competitive advantage can be established.

If the process or function that is to be benchmarked is chosen for its alignment with the strategy of the firm (eg. critical success factors), then benchmarking becomes a means to convert strategy into action.

In the next section of the research, the concept of key attributes will be introduced. The phases to a benchmarking programme will then be discussed and within each phase key attributes will be identified.

4. KEY ATTRIBUTES

A. Introduction

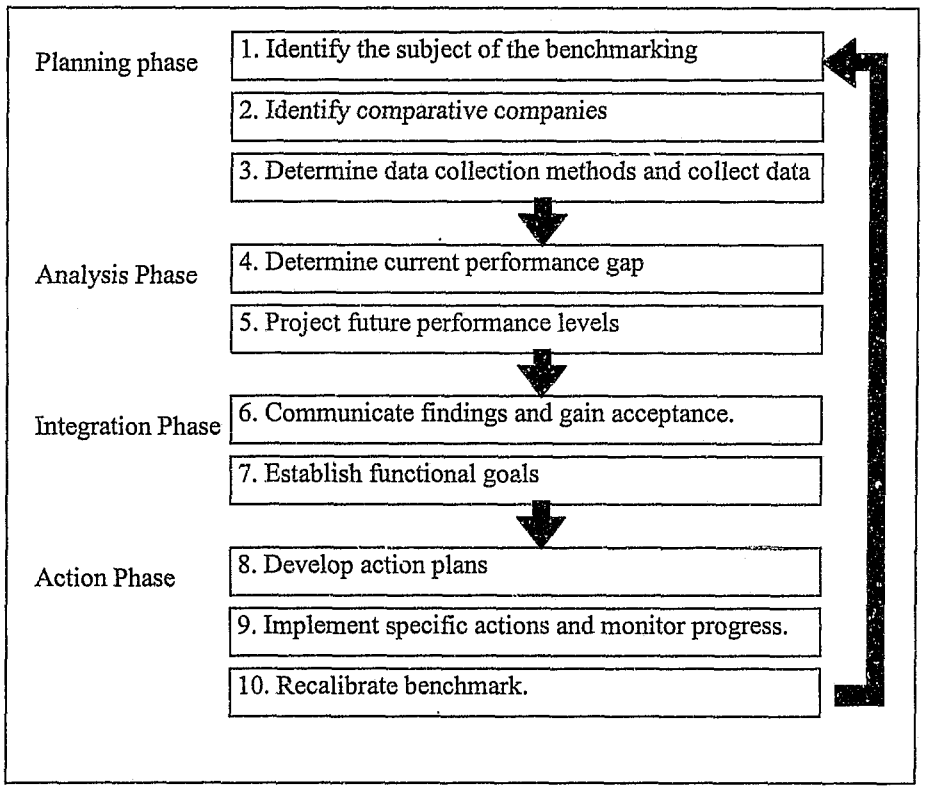
Key attributes are the factors critical to the success of a benchmarking programme. These key attributes can be akin to critical success factors for a business operation, but apply to the success of a benchmarking programme. The success of a benchmarking programme for the purposes of this research is the extent to which the management's expectation of the programme has been fulfilled. Due to a comparative lack of literature studying the South African understanding and application of benchmarking, the key attributes have been identified from international literature. It is expected that South African operating peculiarities and general misunderstanding of benchmarking will render certain international key attributes to be irrelevant whilst others unique to the South African environment may not be identified.

The method adopted to identify key attributes is to use the structure of a benchmarking programme as identified by Camp (1989), as a base. Key attributes relating to each step in the process can then be identified and the interrelationships clearly explained. It is not the intention of this research to delve into the benchmarking process itself, but to utilise the underlying process to determine key attributes of a benchmarking process.

B. The Benchmarking Process

The overall structure of the process of benchmarking as defined by Camp (1989) is illustrated in Figure 1.

Figure 1. The Benchmarking Process



The benchmarking process is based on a four-phase approach: planning, analysis, integration and action. This process represents a logical flow of information and actions hence any deficiencies in the earlier phases should have an effect on the success of the concluding phases and the process as a whole. That the benchmarking process is ongoing may exacerbate this effect - deficiencies in earlier benchmarking programmes may impact on current benchmarking programmes.

Benchmarking as an ongoing process, consists of numerous benchmarking programmes in various phases of completion. The completion of one programme initiates the subsequent programme. For the purpose of this research however, a benchmarking programme will be discussed as opposed to a benchmarking process. Each of the phases are disaggregated further into benchmarking steps. Each of these steps will now be briefly discussed and the purpose of each and the aggregated key attributes relating thereto identified as from the international literature relating to benchmarking (Bendall *et al*, 1993; Bowman *et al*, 1994; Camp, 1989; Chang *et al*, 1994; Kharbanda, 1993; Ottenhouse, 1994; Ohinata, 1994; Shetty, 1993; Walleck *et al*, 1991; Watson, 1992; Watson, 1993). Due to the majority of key attributes being cited by more that one author, only those key attributes deemed to have been uniquely cited by an author have been referenced as such.

Phase 1 - Planning

The key aspects of the planning phase can be identified as: the extent of planning required; determining what to benchmarking; who to benchmarking against; and how to collect the data. Each has been separately discussed.

a) The extent of planning required:

The planning phase represent the initial efforts of a firm in a benchmarking programme. It is considered critical that the benchmarking programme as a whole be adequately planned and the goals clearly defined. It has been submitted that this phase should constitute as much as 50% of the time allocated to the benchmarking programme (Kharbanda, 1993).

b) What is to be benchmarked:

- Business processes should be emphasised not functional divisions:

  The subject of a benchmarking programme can be a process; a product or service; or a strategy. Process benchmarking involves a comparison of operations and business practices and processes. Product or service

benchmarking entails comparisons of products or services. Strategic benchmarking involves comparing organisational structures and strategies and management practices. (Drew, 1997)

- Aligned with a firm's mission and goals:

  The alignment with the firm's mission and goals must address customer satisfaction and costs. The customer's needs and perspectives should dictate what is to be benchmarked.

- Only focus on critical processes important in providing competitive advantage:

  The Critical Success Factors of a firm, and the derived Key Performance Indicators are considered a useful method for identifying the subject of a benchmarking programme (Malcolm, 1996). It is important that only a critical few processes be focused on (Watson, 1993), to ensure that the scope of the benchmarking programme is not too broad.

c) Against whom will we compare (the target of the benchmarking programme) :

- Target firm not limited to competitor firms:

  The target of the benchmarking programme is that firm exhibiting the best practice, against which benchmarking comparison is to be made. The best practice may be within various entities: within the organisation (internal), within a competitor (competitive) or within a related or unrelated industry or internationally (global). However, Ohinata (1994) submitted that the target firm should not be a direct competitor in the selected benchmarking area.

- Bi-directional information exchange:

  Reciprocity of information exchange results is a win-win relationship which ensures future co-operation in benchmarking programme. Benchmarking parties must be convinced that there is a mutual benefit to the transfer of information. Alternatively, contemporary benchmarking programmes have the opportunity to access information within a benchmarking clearing house. This offers a favourable alternative to direct comparisons where information security may limit disclosure (Ottenhouse, 1994).

d) How will data be collected:

- Use all information readily available in the firm:

  A large proportion of data should be obtained internally before any attempt is made to obtain external data (Boxwell, 1994; Shetty, 1993). Customers and staff are usually important sources of information that is easy and cheap to obtain. Competitors can be approached directly or competitor information obtained indirectly from third parties.

- Confidentiality of information:

  Confidentiality of information is vital and contractual agreements are a means of limiting access and restricting use of the information.

- Validating information obtained:

  A firm will have numerous sources of data. Any information obtained from a benchmarking programme should be validated to the extent that the firm has corroborating evidence.

Phase 2 - Analysis

Determine the current performance and what future performance will be:

- Gain a clear understanding of the firm's current performance:

  Before any comparison can be made between the benchmarking firm and the best practice firm, the current performance of the benchmarking firm must be determined. The performance compared represents both the firm's factual and perceived performance (Bowman *et al*, 1994). The comparisons enables identification of the performance gap - the differential between the firm's performance and the best practice. Most importantly, it allows for the underlying reasons for the superior performance to be identified i.e. the drivers of the superior performance. Once performance gap has been identified, the firm can redesign the current process and determine what the new model will do.

- Limit the number of measures used in the analysis:

  The comparison is best serve by limiting the number of measures used in the analysis of the data. Over analysis can only result in information overloading.

- Emphasize processes and practices in addition to financial results:

  The analysis of the benchmarking information must be such that there is not a bias toward performances which directly impact favourably on financial results. Rather, the underlying superior performance must be analysed. It is this superior performance which will eventually result in improved financial performance.

Phase 3 - Integration

- Active commitment displayed by top management:

  Unless a benchmarking programme is completely and actively supported by top management, the programme will not reach its full potential. In addition, the perceptions of top management and the workforce relating to the benchmarking programme and its benefits should be aligned.

- Create a continuous improvement culture within the firm:

  In order to ensure attainment of the superior performance in the future, the benchmarking findings must be communicated to all staff. Unless the staff accept the benchmarking findings, superior performance will never be achieved. This requires commitment, support and ownership of the findings by the staff (Camp, 1989). This represents a continuous improvement culture within the organisation; a willingness to change and adopt findings.

Phase 4 - Action

a) Develop action plans to achieve operating standards and measure success:

- Knowledge obtained must be converted to action:

  A plan of action is of no good unless it is acted on. Karlöf & Östblom (1993) describes this phase as "proceeding from thought to deed and achieve [ing] a measurable improvement in the firm's performance" (p. 177).

- Best practices should be adapted to the firm's skills and position:

  The identified best practices, however, require adaption to suit the particular operating situation of the firm. The firm should not just emulate the practice else its best possible performance will never surpass that of the target firm. Feedback relating to the extent and success of the implementation are fundamental to the monitoring of the firm's acceptance of operating standards. However, a *caveat* is that the action phase should not exceed 3 months else possible loss of motivation might ensue (Boxwell, 1994).

b) Recalibrate benchmark:

- Benchmarking must be a continuous effort

  As soon as a new benchmarking practice has been integrated into a firm's operation, the benchmarking is outdated (Bendall *et al*, 1993). Benchmarking firms should consider benchmarking core competencies (activities central to the organisation's existence) on an ongoing basis. This ongoing analysis requires a culture of change and innovation to be developed within the firm. Zairi (1996) explains that developing a culture of innovation requires:

  > "...putting in place systems, procedures, skills, structures and the right level of resources to initiate and sustain a never-ending approach to innovation" (p. 136).

CHAPTER 3. RESEARCH METHODOLOGY

1. INTRODUCTION

The detailed literature review has addressed what is meant by benchmarking; has identified and defined the key attributes; and discussed the interaction of these key attributes. These key attributes represent a theoretical framework of the critical success factors of a successful benchmarking programme.

This framework has been used as the basis of a semi-structured interview with relevant managements of selected firms. The interviews were semi-structured to test the validity of the attributes identified; to enable the identification of key attributes not identified in the literature review; and to assess whether these are peculiar to the South African situation.

The interviews were also directed towards any possible impact on performance resulting from the implementation of the benchmarking programmes. Apart from the questionnaire and interview, additional information was obtained by reviewing documentation relevant to the implementation of the programme.

The information was collected from five firms selected from within the South African economy. The only criterion for selection was that the firm had implemented a benchmarking programme. The intended effect was a selection of firms with successes and failures in benchmarking. The questionnaire included five initial structured questions relating to the firm selected - operations, benchmarking history and general understanding of benchmarking. This allowed a brief description of the firms selected, which is as follows:

2. OPERATING CIRCUMSTANCES OF FIRMS SELECTED

The purpose of this section is to describe briefly the situation of each of the selected firms. This serves to explain the operating circumstances of the firms which may have

had an impact on the benchmarking programmes conducted and hence the responses in the interviews. The firms selected have been numerically indicated as follows:

Firm 1 : operates within the pharmaceutical industry. The firm has conducted two benchmarking studies in the past, one of which resulted in a restructuring and re-engineering of almost the whole organisation. The benchmarking methods were learnt from textbooks, articles and visits by international organisations. External consultants have never been used. Management believes that benchmarking is an important survival aid for South African businesses as they are forced to compete internationally. Management found that benchmarking enabled the firm to achieve a competitive advantage which still has not been attained by some competitors.

Firm 2 : operates within the petrol-chemical industry. The firm has only started with benchmarking in the last 2 years and at present has conducted less than five programmes. It is however management's intention to consistently apply benchmarking in the future. An international benchmarking consultant conducted the latest benchmarking programme. Management believes that benchmarking is an important survival aid for South African businesses as businesses are forced to compete internationally. Management however believe that although the concept is currently well known it is often incorrectly interpreted.

Firm 3 : operates in the electricity supply industry. The firm has to date conducted in excess of 10 benchmarking programmes and considers that it applies benchmarking consistently. Benchmarking was learned internally and from a variety of external sources (textbooks, articles, visits by international organisations and consultants). The management believes that benchmarking is known by most firms in South Africa and is only important to some organisations. This comment is based on the experience of the management that South African firms are generally not willing to change sufficiently to shift their current reality-their paradigm. This concept is explained further in the empirical research section

to this paper.

Firm 4 : manufactures industrial water valves and accessories. The firm has conducted between one and five benchmarking programmes based on knowledge obtained from textbooks, articles and associated training programmes. Management believes that benchmarking is an important survival aid for South African firms as they are further subjected to international competition. However, it believes that although the concepts of benchmarking are know widely within South African industry they are often misunderstood. .

Firm 5 : operates in the motor retailing, service, parts, and vehicle financing and insurance industry. This represents a mature industry that has well established practices, which have been challenged in the last decade due to changes in markets, products and international trends. The local industry however, does not differ markedly from that internationally. This factor enables any financial or best practice information derived internationally to be easily adopted by local firms. The firm has used benchmarking on an ongoing basis and in the last 26 months has created a detailed database. Management is continually learning of benchmarking from articles, consultants and international organisations. Management believes that the concepts of benchmarking are known by most firms in the local arena, but usually misinterpreted.

In the following section, the practical implications of the theoretical framework will be identified and examined.

CHAPTER 4. THE EMPIRICAL TESTS

1. MANAGEMENT'S RESPONSES AND SPECIFICS OF THE SOUTH AFRICAN ENVIRONMENT

A. Impact on individual phases of a benchmarking programme

Due to the nature of the questionnaire and interviews, additional key attributes not identified in the literature review and further understanding of the existing key attributes were noted. In each case, an attempt was made to determine if the additional key attributes could be attributed to the operating environment in South Africa or if they are internationally relevant. Within each phase of a benchmarking programme, the general application of the identified key attributes within the selected firms is firstly discussed. In particular instances, the actual importance of the key attributes identified internationally was questioned by the firm's management. Their reasoning has been included hereunder.

Phase 1 - Planning

a) The extent of planning required:

Internationally, the planning phase of any business project is considered the most important. The proponents of this view even advocate the quantification of the time to be spent in the planning of projects (Kharbanda, 1993).

The South African environment is generally in a state of flux due to it being seen as an emerging market and hence susceptible to international trends. Such emphasis on project planning in the local environment may be seen as counter productive.

This was the case with the benchmarking programme conducted by firm 1. Management decided that it would be more feasible to undertake limited planning before commencing the benchmarking programme. The logic was that the programme could be steered in the right direction as it became necessary. The result was that the initial planning phase was merely to briefly plan the project and

motivate the employees. Management agrees that the success of the benchmarking programme was mainly attributable to the planning of the programme being flexible. An additional spin-off was that the firm gained a continuing competitive advantage. The flexible planning allowed the firm to complete the benchmarking programme in the time it took a competing firm to just compete its planning.

Firm 5, did not conduct formal planning. Management explained that its situation is such that it is continually benchmarking to ensure that the information against which to benchmark is readily available for integration. As a result, they find it difficult to distinguish the planning phase separately from the other phases of a benchmarking programme.

b) What is to be benchmarked:

- Business processes should be emphasised, not functional divisions:

  All the firms except firm 5, agreed that the business processes should be emphasised in a benchmarking programme rather than the functional divisions. Firm 5 however benchmarked on a functional division basis. This was mainly due to the reliance on the management information system and the use of financial results, which were reported by function, as a base for benchmarking. No adverse effects were identified by the firm selecting this approach.

- Aligned with a firm's mission and goals:

  The alignment of the benchmarking programme with the firm's mission and goals was not deemed critical by four of the firms selected. However, this aspect was considered important for firm 5 to the extent that a benchmarking programme must address customer satisfaction and costs. Management agreed that the customer's needs and perspectives directly dictate what is to be benchmarked through the use of customer satisfaction surveys.

- Only focus on critical processes important in providing competitive advantage:

  Although critical processes were part of the benchmarking programmes of all the firms selected, this did not appear to be the result of a conscious decision. The basis

of the selection was usually to achieve competitive advantage, which would improved financial results in the long term.

c) Against whom will we compare (the target of the benchmarking programme) :

- Target firm not limited to competitor firms:

  During the planning phase, the firm selects whom to compare against- the target firm. Managements of the firms interviewed have no doubt that the selection must be based on the target firm having significantly better practices. There was also consensus that the better practice need not be the best in its class, provided it is better than the firm's current practice. Managements continued, that in South Africa, competitor firms are usually a first choice in selecting target firms. This is in stark contrast to Ohinata (1994) where it is recommended that the firm and the target firm should not be direct competitors in the area that information is to be exchanged. If firms are competitors in the field being benchmarked, it is of utmost importance that ethics be upheld throughout the study. The firms all agreed that members of a benchmarking team should not misrepresent the purpose of the study.

- Bi-directional information exchange:

  South Africa has historically been a closed environment resulting in excessive industry competitiveness. As a consequence firms are generally sceptical about sharing operating information. The lack of willingness to share information results in each firm becoming a closed entity - willing to receive information but reluctant to disclose any. Due the above reason and the nature of the industry that firm 1 operated in, management decided to benchmark internally within the international group. It is proposed that this reluctance to share information will subside with the use of industry databases and consultant firms in the future.

  Firm 2 overcame the reluctance to share information by employing consultant firms with vast information databases. Management did however warn that a firm must ensure that the database has sufficient industry specific information else ease of

comparison may be jeopardised.

Firm 4 re-iterated this unwillingness of South African firms to share information. Management explained that firms view all information as proprietary and assume that any sharing of information will reduce the firm's competitive advantage. Although benchmarking should be on a *quid pro quo* basis, South African firms always attempt to attain more than their fair share of information. The result is non-parallel sharing of information - a situation destined to failure. Firms may even create a co-operative facade yet they will only share information in terms of their own agendas. It was this inherently closed nature of South African firms that made firm 4 choose to benchmark internally within the group. Management believes this afforded benefits in that all aspects relating to: choosing a target company; obtaining the information; analysing and adapting the information to the firm's operations, were avoided.

The situation of firm 5 contrasts with those of the other firms investigated. Firm 5 operates within the motor industry. This is a mature industry subject to continued pressures in the last decade due to changes in markets, products and international trends. These pressures and international trends have had two main effect with regards to benchmarking:

1. *The survival of ALL firms within the industry has been threatened:*
   Once the survival of the firms within the industry was threatened, the industry moved from a closed environment, sceptical of information sharing, to an industry willing to share information provided it benefited itself. This information sharing was particularly prevalent in the large organisations where access to information within different divisions was encouraged.
2. *The local industry was found to be comparable to the industry internationally:*
   Due to established nature of the industry internationally, a high degree of comparability exists between local firms and the international industry. Financial or best practice information derived internationally is easily adopted

by local firms. The result is the smoother integration of the benchmarking information.

d) How will data be collected:

- Use all information readily available in the firm:

  Management of firm 3 believed that internal information should preferably not be used as a first source of information. This reasoning was based on the premise that any internal information will biased by the firm's current paradigm. This effect of a firm's paradigm is futher discussed in subsequent sections. Other than firm 3, the other firms believed that any internal information is a preferred source as it is easer to obtain, cheaper to collect and easier to adopt.

- Confidentiality of information:

  A conclusion could not be reached in regard to this key attribute. Those firms which had obtained information from internal sources or from a benchmarking consultant did not deem this important. However, those firms which benchmarked externally, deemed this attribute as critical.

- Validating information obtained:

  Although the firms interviewed did not class the validation of information obtained as critical, the perceived validity of the data was particularly important to firm 2. This firm used international benchmarking consultants to perform the benchmarking programme.

  Management of firm 3 found that in the past, when internal benchmarking studies had been conducted within the firm, the results of these studies indicated that the firm had to change. Top management was, however, not convinced as to the accuracy of the findings, mainly due to the information being internally generated. The results were accepted but no further action occurred. It was only when international consultants were hired that action resulted from their findings. This implies that management were reluctant to believe local internal information; the information was not given the same degree of credibility.

Phase 2 - Analysis

- Gain a clear understanding of the firm's current performance:

  Before any comparisons are possible the firm must have an understanding of the firm's own operation. This represents the base on which any best-practices can be compared. Of the firms selected, all except one (firm 3) believed that this base understanding of the firms' current operations was essential.

  Management of firm 3 however, stressed that an understanding of other possible operating realities (alternative processes, products or strategies) would be more beneficial to the benchmarking programme. This understanding of other realities would enable identification of the drivers of a process - grasp of the application of the best practice.

  It is proposed that emphasising the current operations may result an entrenchment of the current methodologies and culture; the result is a bias to remaining static. This understanding of other operational realities was referred to by Spendolini (1992) as 'thinking out of the box' - moving out of one's comfort zones to achieve superior performance. This involves a move from emphasizing internal best practices to external best practices, with the ultimate being international best practices.

  This understanding of the fim's current performance also entails the benchmarking team quantifying the firm's and the best practice performance. In addition, it must be possible to explain why or how the superior performance was achieved.

- Limit the number of measures used in the analysis:

  Walleck *et al* (1991), recommend that the number of measures used to analyse the data be limited to a pertinent few. However, as firm 5 has an advanced managment information systems (MIS) function, financial information relating to all aspects of the firm is readily available. Management believes that it is better to have too many

measures and then to be able to focus on those deemed important than to have too few. This method has proved particularly effective in the mature environment of firm 5's industry.

- Emphasize processes and practices in addition to financial results:

  The performance measurement and reward system at firm 4 placed heavy emphasis on the financial results. The choice by management of which processes to benchmark was based primarily on what actions would be measured and rewarded. In other words, the performance and reward system indirectly dictated which processes would be part of a benchmarking programme. This South African peculiarity contrasts with the international literature, where the choice of the process to be benchmarked was based on other factors, and the performance and reward system subsequently aligned to ensure performance was in terms of the new benchmark operating standards.

  The management of firm 3, however, believed that due to the financial information being such an important part of performance management and reward, these factors can often articulate change. The financial information represents the results of operational strengths and weaknesses and so any emphasis on particular financial numbers or ratios as part of a benchmarking programme will have an effect on the underlying process. The danger in this approach is that significant improvements to a underlying process may be overlooked by emphasising the financial aspects.

  Management of firm 5 applied a similar emphasis on financial results. The industry in which firm 5 operated was well established. Management had access to financial information applying to a wide variety of functions within the industry. This information was available in sufficient quantity and depth that most operations were measured and could be monitored. The information was based on both international and local sources. By analysing the firm's operations through numerous financial measures, management was able to identify those aspects requiring attention.

Additional measures were then applied in that area, further disaggregating the problem. These additional measures enabled the cause of the problem to be identified. The problem process could then be analysed in depth and a solution developed.

Phase 3 - Integration

- Active commitment displayed by top management:

  Unless a project has the firm support of top management who understand the process and are willing to remove obstacles to success of the programme it is doomed to failure (Camp, 1989). Firm 2 found that unless top management was the *driving force* behind a project it would not achieve its full potential. The mere authorisation of projects by top management which are then performed by middle management is not sufficient. Management agreed that top management's direct involvement causes the project to sell itself. The result is that the whole firm 'buys-in' to the project resulting in success. Elnathan *et al* (1996) identified ways in which management commitment could manifest itself:

  * Providing adequate authorisation of project;
  * Provide funding for the project and training;
  * Utilise professional relationships with other firms to solicit benchmarking participation.

  It was however warned by management, that overselling a project can lead to employees becoming blasé and the benchmark findings not being fully converted into operating actions.

  Without top management involvement, the benchmarking programme will not be given sufficient resources to be completed successfully. Management may supply sufficient resources for one programme, but then restrict resources on subsequent programmes. The effect is that benchmarking cannot be performed effectively on a continuous basis. The result is that the extent of top management involvement has a pervasive effect on the success of any benchmarking programme. The establishment

of a benchmarking programme is merely a step in the greater scheme. The support and sustainment of the programme are vital steps necessary to the success of a benchmarking programme.

- Create a continuous improvement culture within the firm:

  The initiation of subsequent programmes or even initial programmes should however not be limited to ensuring the firm's survival. Implementing a benchmarking programme should be considered an integral part of the firm's continual effort for improvement. Managements of all the firms strongly agree that this attribute is critical; benchmarking should not be seen only as a life-boat for ailing firms.

  All the firms consulted feel that an organisation must be willing to adapt to better practices. If better practices are forced onto a firm, the employees not willing to change will resist, to the detriment of the entire firm. Openness to new ideas can be considered essential. This aspect of resistance to change within a firm is further discussed using the concept of a paradigm in the following section.

Phase 4 - Action

a) Develop action plans to achieve operating standards and measure success:

- Knowledge obtained must be converted to action:

  The action phase can be considered as important as planning in a benchmarking programme. The success of the prior phases become irrelevant if the firm fails to act on the information gained. The crux is that any knowledge gained must translate into action. Boxwell (1994) emphasised that the action phase is " the junction in the study that...determines whether the study will be a success or not" (p. 115). The importance of this attribute was confirmed by all the firms selected. They all believe that this is critical to the success of a benchmarking programme and will affect management's attitude to future programmes.

- Best practices should be adapted to the firm's skills and position:

  Although all firms selected agreed that the best practice must not merely be emulated, but rather adapted to the firm's resources, the issue of size differential produced additional responses from management. The importance of the firm and the target firm being of the same size was identified as a key factor of successful benchmarking in Japanese firms (Ohinata, 1994). The management of firm 3 believes that size should not be a consideration in the choice of the target of the benchmarking. The importance lies in the ability to take the information derived from the target firm and to adapt it to the firm's position, resources and strategic direction. Watson (1993) identified the significance of the ability to integrate information within the firm:

  > " no two businesses are alike...and practices from one business are not directly transferabl to another without rigorous examination of areas that need to be translated to fit a different environment and culture"

  Although size is an indicator of the ability to adopt the findings of a benchmarking programme, this should only be seen as one consideration factor. A more detailed analysis and understanding of the firm and the proposed target firm will complement the selection of the target of the benchmarking programme.

  Firm 5 stressed that although it was important that the firms be of similar sizes, it has found that firms with a similar geographic positioning was a more important factor. Differences between regions relating to: the product mixes sold; the product prices and discounts and the quantities sold influenced the financial results of the firm. The result was that firm 5 compared operations based on geographic positioning rather than on the size of the operations.

b) Recalibrate benchmark:

- Benchmarking must be a continuous effort

  Benchmarking is not a one-time process. Competitive environments change and so should the benchmarks against which the firm is measuring itself. For

benchmarking, as a process, to become competitive it must be continually applied (Sharman, 1992). Benchmarking as a continuous process was emphasised by Freedman (1996):

> "Continuous benchmarking is a management philosophy that needs to be embedded within the culture of the organisation for the enterprise to meet competitive challenges in the global marketplace"

Firm 1 performed a benchmarking study in its entirety, yet failed to treat it as an ongoing process. The management of this firm believes that this is a trait of South African businesses where each project has a distinct beginning and end. Failure to create this continuous improvement culture within the organisation can lead the firm to lose any competitive advantage. This was confirmed by the management of firm 4 who explained that South African firms lack a culture of continuous change. The firm comes to believe 'not to fix what isn't broken'. This is a belief that can result in corporate suicide as the international competition emphasises continuous improvement.

B. Pervasive impact on a benchmarking programme

Shifting the firm's paradigm

Management of firm 3 contests that the concepts of benchmarking are sound and can offer firms immense operational and strategic improvements: it maintains that the potential is never fully utilised. The reasons relates to management's willingness or lack of willingness to change the firm's current paradigm.

For the purposes of this paper, a firm's paradigm will be defined as its current operating and strategic realities. These become entrenched within all levels of operation and dictate how a firm will react to opportunities and threats. The operating decisions are determined by the extent to which opportunities and threats are aligned

to the firm's paradigm. Management may expressly or tacitly obstruct any challenges to the paradigm.

Management of firm 3 believes that the operational benefits from benchmarking representing improvements of a few hundred percent do not represent the potential. These improvement do not challenge the current paradigm. This is because these improvements are superficial and do not alter the fundamentals of the firm's operations. They believe that improvements of up to 2000 percent may be possible from benchmarking. Such potential improvements require changes to the processes, operations, strategy and management policies. These represent circumstances threatening the current operating realities - the firm's paradigm. If the fundamental philosophy of the firm is altered this represents a paradigm shift.

Change requires a realisation that a gap exists between the firm's vision or strategy and its current operating reality. The change can then take place by either moving the firm's vision to its operating reality (the easiest and most accepted) or by moving the operating reality to meet its vision. Benchmarking serves to identify the firm's current operating reality. If the gap challenges the existing paradigm, then any proposed paradigm shift will not be easily accepted. The change will cause tension and anger in the employees content with the existing realities. However, after a paradigm shift commences, the firm will progress in all dimensions at a great rate. Manning (1997) mentions this effect in that:

> 'The firm that turns its industry paradigm upside down may trigger unhappiness in the short term, but it invariably gains an enormous advantage in the longer term'(p. 116)

Eventually the old reality is replaced with a new reality which can be vastly different to the previous (Peters & Waterman, 1982).

It is proposed by firm 3 that top management will only drive a paradigm change if the firm's current existence is threatened. The result is that benchmarking will be most

effective when management are placed is an operating or financial position which requires them to change dramatically. The willingness to change will make management cognisant of the potentials of benchmarking. In addition it was proposed that the current trend for businesses to benchmark does not represent a paradigm shift but rather a fear by management that they may be left behind. The reason given is, "if all other firms are doing it must be good for us" - at typical emulation approach.

Camp (1995) relates the purpose of benchmarking to the firm's paradigms. He states that the purpose of benchmarking is:

"...to break the paradigm of not being able to learn from others." (p. 14)

Unless this paradigm is shifted, a firm will continue to believe that they are the best and that they don't need to be compared to any standard, be it internal, industrial or international.

2. SUGGESTIONS TO FOLLOW UP RESEARCH

It is believed that although benchmarking studies are being performed by firms within South Africa, these studies are having only limited success. The reason for this may not relate to the actual benchmarking process but rather to the organisations ability to change. It is submitted that until firms are able to shift (or possibly even breakdown) their current paradigms relating to their operating and strategic realities, the true benefits of benchmarking will never be evident. Further research is recommended by linking the concepts of change management and benchmarking to determine if benchmarking is being down played by the limits imposed by a firm's limited ability to change.

CHAPTER 5. CONCLUSION

The framework has identified the key attributes neccessary for the success of a benchmarking programme. Within the South African environment however, benchmarking has historically been misunderstood and the firms interviewed believe this still to be the situation, although it is improving. The research has identified that the application of key attributes in a benchmarking programme within South Africa is not always consistent and often differs from international practices. In addition, many attributes of a benchmarking programme specific to the South African environment have been identified and discussed.

Management must be aware that a benchmarking programme will be a precursor for change. The proposed improvements will be in contravention to existing operations and will cause tension. These changes require close supervision and must be managed.

Historically, access to and collection of benchmarking information are important steps in the benchmarking process and are often the most time consuming. Internationally, as information is collected by firm consortiums, consultant and industry databases the access to benchmarking information is being made simpler. In the future, the information databases could reach a critical mass where firms could obtain 'off-the-shelf' business best practices merely requiring adaptation to the firm's specifics (Scott,1996). It is submitted that the effect will be a move away from the planning and analysis phases of benchmarking to the implementation and action phases.

In conclusion, benchmarking although effective, is merely one of numerous management techniques to aid a firm in its quest for improvement. Benchmarking should not be seen as the holy grail of managment improvement and strategy formulation. Hayes (1994) warns that by "...managers pin[ning] their competitive hopes on the implementation of a few best-practice approaches, they implicitly abandon the central concept of a strategy in favour of a generic approach to competitive success."

REFERENCES

Bendall, T. Boulter, L. & Kelly, J. Benchmarking for competitive Advantage. Pitman Publishing, London. 1993. Pg. 74

Boxwell, R.J. Benchmarking for Competitive Advantage. McGraw-Hill Inc. 1994.

Bowman, C. and Faulkner, D. Measuring product advantage using competitive benchmarking and customer perceptions. Long Range Planning, Vol.27 Number 1. 1994.

Camp, R.C. Benchmarking: The search for Industry Best Practices that Lead to Superior Performance. ASQC Quality Press, Wisconsin. 1989.

Camp, R.C. Business Process Benchmarking: Finding and implementing best practices. ASQC Quality Press, Wisconsin. 1995.

Chang, R.Y. and Keith Kelly, P. Improving Through Benchmarking. Kogan Page, London. 1994.

Drew, S.A. From Knowledge to Action: the Impact of Benchmarking on organisational Performance. Long Range Planning. Vol 30 Number 3. 1997

Eccles, R.G. The Performance Measurement Manifesto. Harvard Business Review, January-February 1991. pp 131- 137.

Elnathan, D. Lin, T.W. Young, S.M. Benchmarking and Management Accounting: A Framework for Research. Journal of Management Accounting Research. Vol. 8. 1996

Freedman, J. IMA's CIC Benchmarking approach is favoured. Management Accounting. October 1996.

Hayes, R.H. and Pisano, G.P. Beyond World-Class: The New Manufacturing Strategy. Harvard Business Review, January-February 1994. Pp 77 - 85.

Kaplan, R.S. and Norton, D.P. The Balanced Scorecard - Measures That Drive Performance. Harvard Business Review, January-February 1992. pp 71 - 78.

Karlöf, B. and Östblom, S Benchmarking: a signpost to excellence in quality and productivity. John Wiley & Son Ltd, England. 1993.

Karlöf, B. Benchmarking Workbook. John Wiley & Son Ltd, England. 1995.

Kharbanda, M. Benchmarking: Making it work. CMA magazine. March 1993.

Malcolm, I. The value of benchmarking management reporting. Management Accounting. June, 1996.

Malcolm, I. Benchmarking- Performance gap... real or a problem of definition? Management Accounting. April, 1997. Pp 38 - 39.

Manning, T. Radical Strategy: How South African companies can win against global companies. Zebra Press, Sandton. 1997

McCarthy, D. Benchmarking and the Management Accountant's New Role. The Chartered Institute of Management Accountants: CIMA in South Africa. Spring, 1996. pp 4 - 5.

Mooney, S. Benchmarking of Product and Process Innovation. An unpublished paper for the degree of Master of Business Administration. University of the Witwatersrand, 1995.

Ohinata,Y. Benchmarking: The Japanese Experience. Long Range Planning, August 1994. pp 49 - 53.

Ottenhouse, D. Making Benchmarking faster, cheaper, and easier. CMA magazine. February 1994.

Peters, J.T. and Waterman, R.H. Jr. In Search of Excellence. Harper & Row Publishers Inc. New York. 1982.

Porter, M.E. Competitive Stategy: Techniques for Analysing Industry and Competitors. Macmillan Inc. 1980

Rockart, J.F. Chief executives define their own data needs. Harvard Business Review, March-April 1979. Pp 81 - 93.

Scott, P. Benchmarking. Management Accounting. July/August 1996.

Sharman,P. A Tool for Continuous Improvement. CMA Magazine. May, 1992.

Shetty, Y.K. Aiming High: Competitive Benchmarking for Superior Performance. Long Range Planning, February 1993.

Spendolini, M.J. The Benchmarking Book. AMACOM, New York, 1992.

Walleck, A.S. , O'Halloran, J.D. and Leader, C.A. Benchmarking world-class performance. The McKinsey Quarterly, Number 1, 1991.

Watson, G.H. The Benchmarking Workbook: Adapting Best Practices for Performance

Improvement. Productivity Press, Massachusetts. 1992.

Watson, G.H. Strategic Benchmarking: How to rate your company's performance against the world's best. John Wiley & Sons Inc. 1993.

Zairi, M. Benchmarking for best practices: continuous learning through sustainable innovation. Butterworth-Heinemann. Oxford. 1996.

Author Smart D A J
Name of thesis Examination Of Benchmarking Practices In South African Firms Smart D A J 1998

PUBLISHER:
University of the Witwatersrand, Johannesburg
©2013

LEGAL NOTICES:

Copyright Notice: All materials on the University of the Witwatersrand, Johannesburg Library website are protected by South African copyright law and may not be distributed, transmitted, displayed, or otherwise published in any format, without the prior written permission of the copyright owner.

Disclaimer and Terms of Use: Provided that you maintain all copyright and other notices contained therein, you may download material (one machine readable copy and one print copy per page) for your personal and/or educational non-commercial use only.

The University of the Witwatersrand, Johannesburg, is not responsible for any errors or omissions and excludes any and all liability for any errors in or omissions from the information on the Library website.