CHAPTER 1

THE PROBLEM AND ITS CONTEXT

1.1 INTRODUCTION

An organization's long-term success and survival depend on the quality that customers receive. Attention to customers doesn't just happen – it is enabled by leaders who truly emphasize the importance of the external and internal customer. However, leadership itself will not be sufficient to complete the quality job. Each organization must have a system that defines the organization, provides guidance for its operations and supports its efforts on its journey to excellence.

Galbraith (1995:2) states that "organizations continuously search for more effective approaches in order to survive, remain competitive, sustain their operations and to grow in an ever-changing and competitive environment. To achieve sustainable business results, organizations must actively manage cost and quality, as well as product and service features by means of the efficient and effective application of managerial and operational systems within a well-designed organizational framework." (See figure 1.1).

Porter and Tanner (2004:3) argue that "in their endeavor to remain competitive, organizations have tried and tested a myriad of performance improvement approaches or performance enablers over the past few decades in search of the ultimate system or methodology. These include ISO 9000, BPR, Business Excellence, Continuous Improvement, TQM, Just-in-Time, Project Management and Six Sigma. Although thousands of organizations implemented these performance enablers, only a few organizations have achieved their envisaged state of excellence."

They further state that "in too many organizations, excellence is a veneer rather than an integrated vision within the organization. The involvement of people in the continuous improvement and transformation of business processes is a fundamental theme that shapes the golden thread of this quality improvement, process improvement and excellence approaches."

Business processes was identified as core to all the enablers and was elevated as a management function to a Critical Core Capability status in most organizations. To be effective, Business Process Management as a Critical Core Capability should encompass the management functions, i.e. planning, decision-making, leading, organizing and controlling, and should be supported by a proper organizational framework that focuses on the principles of effective and efficient utilization of cost and time, as well as the optimum performance of all resources.

The phrase "the optimum performance of all resources" poses another major challenge to the management of business processes as a Critical Core Capability. The optimum performance of resources is intimately linked to process design which is at the core of work design and specifically the creation of jobs and work groups that should generate high levels of employee fulfilment and productivity.

To Kerzner (1997:2) it is clear that "business processes are the only permanent work structures that

transform inputs continuously into outputs as ongoing operations and therefore underpins every activity that touches the organization's resources."

Business process being the core descriptor of the "how", "what", "when", and "why" of every individuals daily interaction with his work, his colleagues, his organization and his clients is maybe by far the biggest factor of satisfaction, dissatisfaction, harmony or conflict in the organization and determines to a large extent what the behavior of the individual, the groups and the organization at large will be on a daily basis.

Ivancevich, Konopaske and Matteson (2005:175) state that "quality of work life refer to a philosophy of management that enhances the dignity of all workers; introduces changes in an organization's culture; and improves the physical and emotional well-being of employees. Thus, the concept and applications of quality of work life are broader and involve more than jobs, but the jobs that people do are important sources of satisfaction."

The above authors further are of the opinion that "the continuing challenge to management is therefore to improve production, quality, and efficiency through revitalizing of business and industry. Job design attempts (1) to identify the most important needs of employees and the organization and (2) to remove obstacles in the workplace that frustrates those needs. Managers hope the results are jobs that fulfil important individual needs and contribute to individual, group, and organizational effectiveness."

In support of this belief, Cummings and Worley (2005:332-340) are of the opinion that "all work design and therefore directly also all process design should be according to a scientific tested approach of which several approaches are available."

Robbins, (1998:629) states that "since the organizations' success or failure is essential due to the things that its employees do or fail to do (processes), any planned change must also be concerned with changing the behavior of individuals and groups within the organization." It is therefore critical that management does have scientific control over the function or Critical Core Capability that touches "the way things get done".

Changes to business processes therefore have a profound and long lasting effect on all the levels of the organization and specifically on the individual and his or her quality of work life. From an organizational behavior and organizational design perspective process management is unmistakable one of, if not the most important Critical Core Capability for management to have control over.

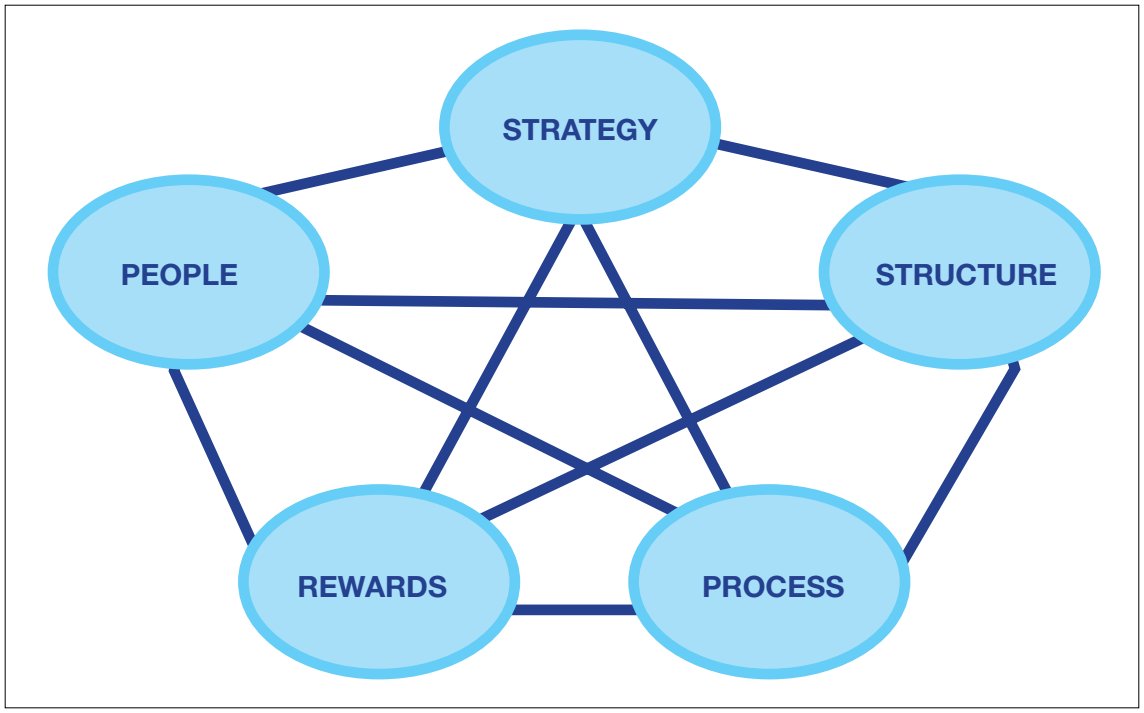

Figure 1.1 Star Model Framework (Lawler, 1992)

The value proposition as delivered to the customer is complex, involving different stakeholders and different outputs, not all within the organization's control. The value proposition can be seen as an organizational effectiveness chain, with various links pivotal to its success. These include the organization's supply chain, customer interfaces, credit management, information technology, as well as external touch points. It is therefore critical to obtain an objective view of the organization's achieved level of process maturity and integration. Who should be involved in process management and improvement? What should be measured and how? In addition to the need for measuring where the organization is in terms of its process management capability, it is pivotal to gauge the level of continuous improvement in all business areas and processes. The Balanced Scorecard or Value Chain Methodology can be extremely useful in measuring and monitoring this.

Resource optimization is imperative, not only for any organization's competitive edge, but also for the economy of any country. Effective Business Process Management allows organizations to attain this level of optimization, provided these processes are properly managed, maintained and measured. What is currently absent is a model that will provide management with the relevant information and ability to measure where the business is in terms of its process management effectiveness, where it should be and what improvements have been made or need to be made.

1.2 THE RESEARCH PROBLEM AND ITS SIGNIFICANCE

Processes have been identified, analyzed, mapped, and "maintained" by organizations and government via their Work-study-, Organization and Methods- and Industrial Engineering Departments since the 1970s. How then do we end up with the same dilemma and try to come up with probably the same solution thirty years later? What exactly is then missing in South African organizations that continuously results in their being plagued by inefficiencies and ineffectiveness in so far as the management of their business processes is concerned?

As part of the drive for efficiency organizations have over the past years defined Critical Core Capabilities such as Risk Management, Brand Management, Innovation Management, Information Management, Complexity Management, Diversity Management, Human Resources Management, Creative Alliance Management, Channel Management, Business Performance Management, Unique Solutioning, Supplier Management, Knowledge Management, Process Management and Process Optimization to mention just a few.

All or most of an organization's Critical Core Capabilities are competitive and profit-derived according to vision, mission and strategy. However, some of the Critical Core Capabilities are also enforced in terms of legislation or partly to be in compliance with legislation:

- Diversity Management in terms of the Promotion of Equality;
- Prevention of Unfair Discrimination Act, Act 52 of 2002;
- Broad Based Black Economic Empowerment Act, Act 53 of 2002; and
- Risk Management in terms of the Banks Amendment Act, Act 19 of 2003.

There is yet another regulatory challenge looming for organizations publicly trading in the United States. With the introduction of the Sarbanes-Oxley Act of 2002, organizations must comply with an extensive new set of corporate provisions that analyze and address financial process risk.

According to SAS (2004), "While the provisions of Sarbanes-Oxley apply only to those organizations listed on the New York Stock Exchange, subsidiaries around the world must comply." According to an AMR Research survey, "Nearly 77% of organizations will spend more on Information Technology (IT), business process change, corporate governance, and/or consulting this year as a direct result of Sarbanes-Oxley compliance. One of the spin-offs of being compliant is that organizations become more attractive to the investment community as organizations can evaluate the overall success of their financial systems and performance management strategies."

Constant change, surge for competitiveness, international competition and legal requirements are just a few of the issues that have forced organizations back to the drawing board. Organizations further strove to find the "golden thread" that would be the key to encompass, manage and control constant change, surge for competitiveness and legislative requirements. This "golden thread" was identified as "processes", whether it be Value-creating processes - (core processes that provide value to customers), Enabling processes – (processes that enable another process to be performed, such as legal advice), Asset-creating processes – (maintenance of the plant and facilities), or Governing processes – (processes that direct other processes, such as planning).

A significant fact has been established and advocated by process managers over the years: the overall organizational environment, strategy, structure, policies, procedures and training approach should be supportive of improvement initiatives. This is particularly pertinent in the organization's focus on the optimization and maintenance of business processes as an enabler for optimum competitiveness and profitability.

According to Cummings and Worley (2005:85-86) "it is important from an organizational environment perspective to acknowledge that the organization is an open system that must interact with its environments to survive and develop. The key therefore is to design all processes to allow an

interface between the system and its environment in order for the system to have sufficient freedom to function while exchanging effectively with its environment *(Boundary management)*."

The answer might be partially evident in what Hales (1993:2) stated. "The effective transformation and shaping of organizations are largely the responsibility of management. Management must create a vision of where the organization wants to go and must create an environment that is conducive to constant adjustment to its vision." The answer is unfortunately not that easy, as we know that the value chain of a sustainable solution encompasses not only the creation of an environment, but also maintaining a state of effectiveness through the constant revisiting and revamping of such an environment. It is also true that this environment is constantly under attack from external and internal situations and various expectations from role-players.

In the light of the aforementioned, the question arises: where exactly lies the problem? Is it found at the inception or the maintenance stage of creating this Business Process Management culture as a Critical Core Capability? Or is the problems rather seated in the organizational behavioral aspects impacted by process design and specifically work design. It is important to constantly acknowledge the role of the individual and the group per se, in the fulfilment of process goals that directly or indirectly become the drivers in the fulfilment of the organizations' vision, mission, goals and objectives.

No evidence could be found of an holistic Business Process Management definition to be referenced indicating the scientific and management principles of Business Process Management. The researcher therefore investigated related fields of study and, within the Project Management arena, identified a scientific definition that can be seen as an indication of the definition that should be compiled for this field of study.

Kerzner (1997:2-6) defines Project Management as "the planning, organizing, directing and controlling of organizational resources to complete specific goals and objectives. Furthermore Project Management utilizes the systems approach to manage by having functional personnel (the vertical hierarchy) assigned to a specific project (the horizontal hierarchy)."

The principles of Kerzner's (1997:2-6) definition on Project Management is therefore borrowed and adapted to describe the criteria in terms of a definition for Business Process Management as a Critical Core Capability.

> *"Since Business Process Management is, by nature, systemic and consists of interdependent parts, an assessment of the Business Process Management functionality or culture in an organization should view such a function or culture as a holistic phenomenon, inclusive of organization culture, strategies, structures, systems, processes, responsibilities, accountabilities, people's behavior, and the environment".*

Therefore, in terms of the literature reviewed, the real circumstances in the industries identified for the study, as well as the gap analysis performed, the Research Problems have been identified as:
The absence of:

- An understanding of the full scope and context of the Business Process Management functionality as a Critical Core Capability of an organization;

- A comprehensive framework to identify the Critical Success Factors that management should have control over within the Business Process Management functionality as a Critical Core Capability of an organization; and
- A measurement tool, model or framework to assist organizations to assess their level of readiness or existing level of capability regarding the Business Process Management functionality as a Critical Core Capability. In addition, the gaps between the existing and desired state in terms of strategies, structures, systems, processes, people behavior to implement and or maintain Business Process Management as a Critical Core Capability should be identified.

The results of this study will enhance the knowledge base on all facets that are needed to sustain Business Process Management as a Critical Core Capability and will furnish organizations with the necessary knowledge and understanding to manage their Business Processes Management function on a continuous basis as a Critical Core Capability.

Due to the tremendous progress made in the acceptance and establishment of Business Process Management as a Critical Core Capability within one of the major financial institutions in South Africa (Organization "A"), the measurement instrument developed has been tested in this organization. This organization has, since 1998, become one of the biggest financial institutions in South Africa. Financial figures over the past years have mirrored their success in brand recognition, best-loved brand, best employer to work for, biggest branch and ATM network in South Africa to mention but a few of its achievements. This organization has, at the beginning of 2003, commenced with the implementation of a fully-fledged Business Process Management philosophy that included the following:

- Adopting Business Process Management as one of the Critical Core Capabilities;
- Establishing dedicated "Group Support Functions" to oversee and manage Business Process Management supported by dedicated functional positions such as Process Owners, Process Custodians, Process Administrators and Process Improvement Consultants; and
- Adopting of the Lean Sigma philosophy at the beginning of 2007.

The measurement instrument was also tested in a retail organization in the Western Cape (Organization "B"). This organization does not practice Business Process Management as a dedicated capability on any level as yet.

In terms of the Business Process Management Competency Assessment Model (BPMCAM) developed, Business Process Management capabilities should be quite mature in most criteria in Organization "A", while the BPMCAM should measure Organization "B" as the direct opposite.

1.3 SCOPE OF RESEARCH

Eleven criteria, supported by numerous Critical Success Factors, have been identified within the reviewed literature as being the most important areas to be included in the Business Process Management functionality. According to the eleven criteria, a framework has been constructed in order for the reader to form an holistic picture of Business Process Management and to enhance the reader's understanding of the total subject matter that constitutes the subject Business Process Management as gathered from the reviewed literature and proposed by the researcher.

The following model (Figure 1.2) outlines the scope of the proposed model.

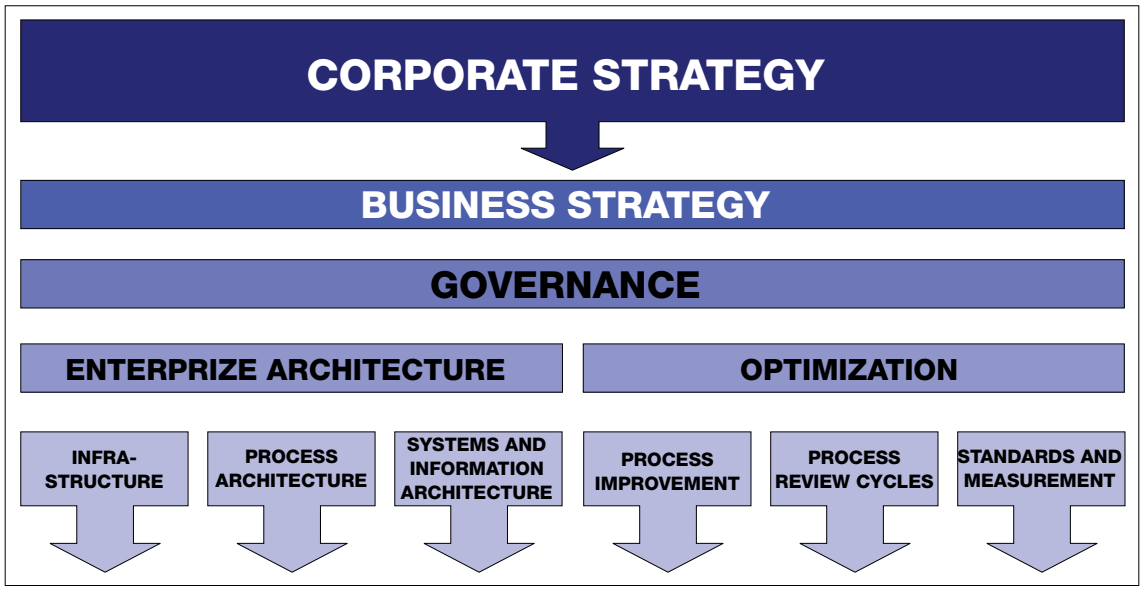

Figure 1.2 BPMCAM Model (Defined by Researcher)

1.4 THE OBJECTIVE OF THE RESEARCH

The objective of the research is to determine, by means of a comprehensive literature review, what functionalities or Critical Success Factors the Business Process Management functionality within an organization should constitute to be classified and sustained as a Critical Core Capability. These functionalities and Critical Success Factors will furthermore be utilized to compile a comprehensive framework that will form the basis of the measurement model to measure organizational readiness and capability to implement and sustain Business Process Management as a Critical Core Capability within an organization.

The primary objective of the research therefore is to develop a Business Process Management Competency Assessment Model based on the identified Critical Success Factors to:

- Measure on a specific scale within the identified Critical Success Factors the readiness of an organization to implement Business Process Management as a Critical Core Capability; and
- Measure on a specific scale within the identified Critical Success Factors the capability of an organization to maintain Business Process Management as a Critical Core Capability once implemented.

As secondary objectives, the research aims to enhance the understanding of the concept by compiling a comprehensive framework that constitutes the scope of the Business Process Management functionality as a Critical Core Capability within an organization.

To facilitate the research objectives, the following research questions must be answered:

Question 1:

What must be implemented, in terms of strategies, governance, enterprise architecture and process optimization, to ensure that organization culture, people's behavior and the work environment will be conducive to successfully establish and maintain Business Process Management as a Critical Core Capability of an organization?

Question 2:
Will the understanding of the concepts, contents and importance of Business Process Management contribute to acceptance on all levels in the organization of responsibilities and accountabilities of the concept and initiatives?

Question 3:
How and how often should organizations assess individual business units, as well as the organization as a whole, in terms of the readiness and capabilities regarding the effective management of the Business Process Management functionalities?

1.5 CONTRIBUTION OF THE STUDY

The importance of the study is mainly embedded in the generic BPMCAM that has been developed as a self-assessment model. The BPMCAM has been developed to be utilized during initial measurement of organizational readiness to become process-centric and process-oriented. Furthermore, it will be used as a proposed "dipstick" for analyzing process maturity once Business Process Management has been implemented. The capability levels in organizational units, as well as actions needed to bridge the identified gaps between current and desired state will also be identified.

The following more specific contribution will be made by the study:

- The identification and defining of the scope and detail of Business Process Management as a Critical Core Capability on the strategic, tactical and operational levels as manifested in the four managerial functions, i.e. planning, organizing, leading and controlling, and as required in the governance and operational dimensions in one consolidated document;
- Compilation of a comprehensive framework that will cover the Critical Success Factors that management should control within the Business Processes Management functionality as a Critical Core Capability;
- The development of the BPMCAM to measure an organization's readiness and competency levels with regard to Business Process Management as a Critical Core Capability:
  - The BPMCAM will determine the organization's initial readiness to implement Business Processes Management as a Critical Core Capability; and
  - The BPMCAM will facilitate a "dipstick" analysis of the level of the organization's existing capabilities and culture to either implement new or maintain existing Business Processes Management initiatives.
- The BPMCAM has been constructed to focus on the business as an holistic entity and not on specific cultural aspects of any nationality or group. This allows for the utilization of the model in any organization or industry.

1.6 RESEARCH PROCESS AND METHODOLOGY

The research process will be based on the Research Process Model as discussed in Cooper and Schindler (2001:61) (See figure 1.3) and will furthermore include the ten steps as set out in figure 1.3a.

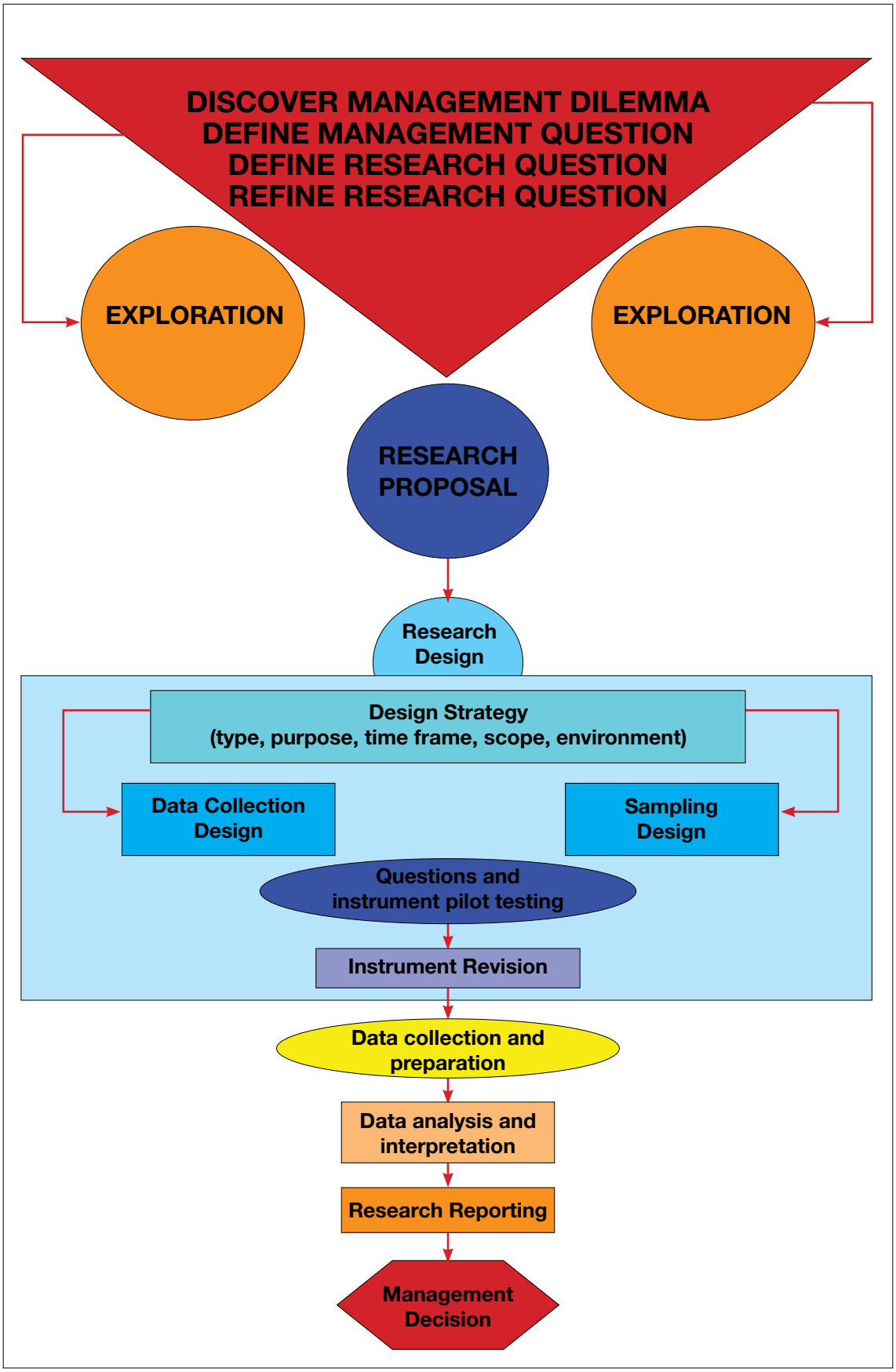

Figure 1.3 Research Process Model (Cooper and Schindler, 2001)

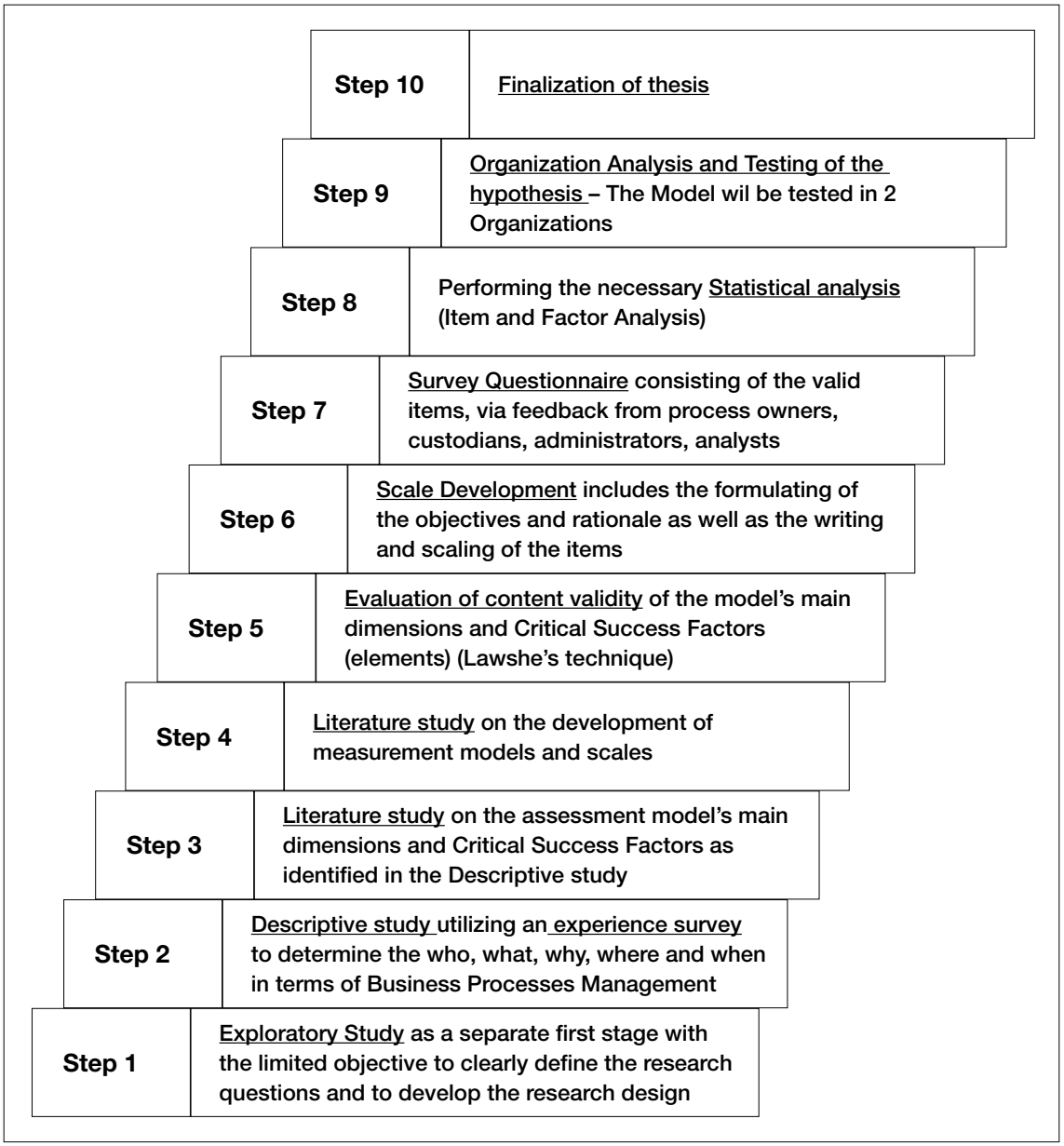

Figure 1.3a Research Process Steps (Defined by Researcher)

The area and scope of research, as well as the model and the specific steps that will be utilized in the study, focus on what is required to answer the research questions as indicated below:

QUESTION 1

What must be implemented, in terms of strategies, governance, enterprise architecture and process optimization, to ensure that organization culture, people's behavior and the work environment will be conducive to successfully establish and maintain Business Process Management as a Critical Core Capability of an organization?

STEPS 1, 2, 3 AND 4

QUESTION 2

Will the understanding of the concepts, contents and importance of Business Processes Management

contribute to acceptance on all levels in the organization of responsibilities and accountabilities of the concept and initiatives?
STEPS 2, 3 AND 9

QUESTION 3
How and how often should organizations assess individual business units, as well as the organization as a whole, in terms of the readiness and capabilities regarding the effective management of Business Processes Management functionalities?
STEPS 3 – 9

The researcher is of the opinion that the stated research questions will address both the primary and secondary research objectives as stated.

1.7 CHAPTER LAYOUT OF THE REPORT

The layout of the thesis is designed to allow a logical build-up of the researchers' arguments from defining the problem to proposing a scientific solution based on the statistical as well as the theoretical meaningfulness of the results derived.

Chapter 1 was an introduction to the dilemma faced by management and an orientation regarding the research questions, the scope and focus of this research study.

Chapter 2 constitutes the findings of the literature review within the areas as discussed below, and set out in Figure 1.4 to facilitate a better understanding of the contextual framework and to respond to the research questions. The researcher developed a new model for the measurement of Business Process Management as a Critical Core Capability and Chapter 2 also aims to provide the necessary insight into the structure of the BPMCAM.

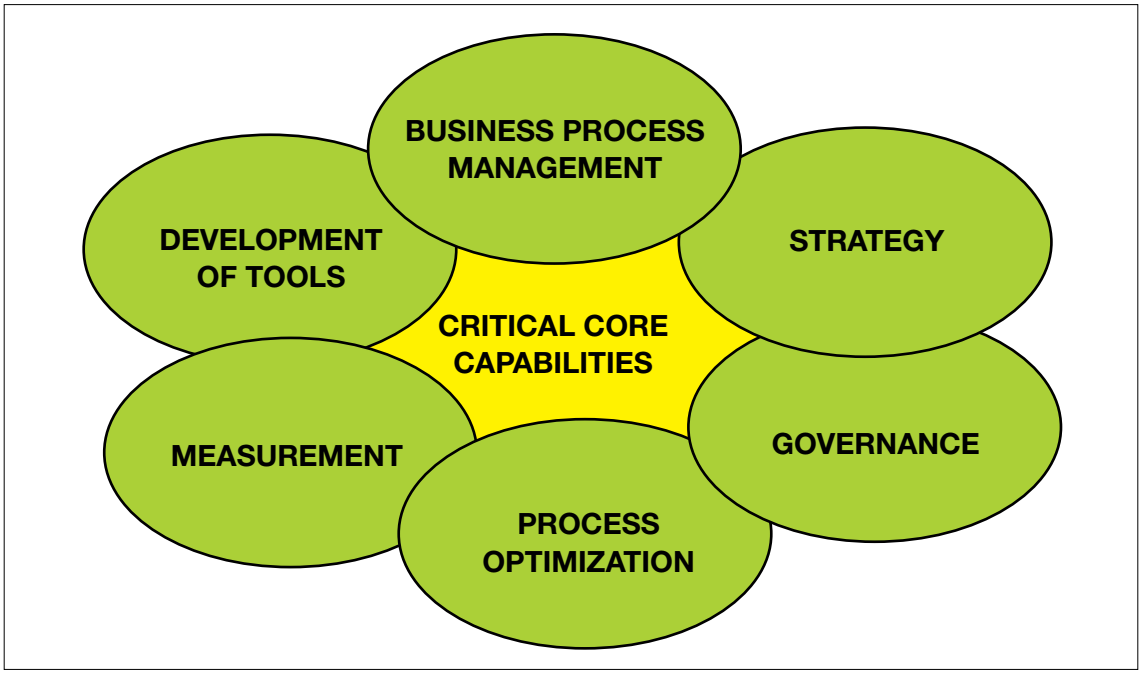

Figure 1.4 Areas of Research (Defined by Researcher)

- Process, Business Process Management and Business Process Management Critical Success Factors;
- Strategy (regarding Business Process Management as a Critical Core Capability);
- Governance and governance factors (regarding Business Process Management as a Critical Core Capability);
- Measurement (regarding Business Process Management as a Critical Core Capability);
- Assessment of Business Process Management and assessment models;
- Development of the Business Process Management Competency Assessment Model; and
- Critical Core Capabilities, Balanced Scorecard, Excellence Models, etcetera.

Chapter 3 discusses the researched methodology in terms of the Research Process Model as per Cooper and Schindler (2001:61) as well as the nine step approach set by the researcher which demarcates the study into distinctive parts such as the exploratory study, the prescriptive study, the literature study as well as the analysis and reporting of findings. This chapter further concludes the findings of the literature research and the research method and will include:

- Introduction;
- Theoretical framework;
- Rationale for methodology used;
- Research design and methodology;
- Population and sampling;
- The steps of the research process;
- Statistical analysis and editing of data;
- Development of the BPMCAM; and
- Conclusion.

Chapter 4 explains the application of the analysis tools i.e. item and factor analysis and provides a comprehensive display of the analysis and results on the total item set of 93 factors as well as the results on the factors clustered within the eleven criteria. The chapter further discuss findings per analysis comprehensively and includes:

- Introduction;
- Results and findings;
    - Evaluation of Content Validity;
    - Statistical Analysis (Factor and Item);
    - Organization Analysis (T-test); and
    - Test of Hypothesis.

Chapter 5 reference the main findings to the research questions and concludes the study with the conclusions and recommendations:

- Introduction;
- Conclusion on answers to research questions and objectives;
- Acceptance of assessment model by experts;
- Value-add to organizations;
- Impact on organization;
- Limitations of study and further study;
- Contribution of the study; and
- Recommendations.

Chapter 6 will constitute the references used in the literature study.

Chapter 7 will constitute the addendums to the research report.

Chapter 1 is an introduction and orientation of the study that was performed regarding the designing of a measurement instrument to measure Business Process Management as a Critical Core Capability of an organization. The research problem, research objectives and research questions were defined. The research methodology was discussed focussing on the research design.

In Chapter 2 the focus is on the eleven identified areas (see figure 2.2) and discuss the evidence found in the researched literature. In order to facilitate a clear understanding and closure of every area the researcher summarizes the researched literature via the identification of the Critical Success Factors that will contribute to the defining of the proposed model.

CHAPTER 2

LITERATURE STUDY

2.1 INTRODUCTION

Within this chapter the researched literature as related to the eleven identified criteria are discussed. The Critical Success Factors contributing to the success of the researched areas are highlighted in order to be included in the measurement instrument being designed. A model constituting the eleven areas is used to reference Business Process Management to the competencies related to Critical Core Capabilities.

The literature study was performed with the primary focus on Business Process Management as a Critical Core Capability of an organization and the design of an assessment model to measure the status and competence level of Business Process Management within such an organization. In order to identify those factors that will enable Business Process Management success, the study endeavored to identify the criteria that constitute the total Business Process Management environment as a Critical Core Capability. The study further endeavored to identify the most relevant Critical Success Factors within every criteria to enable the compilation of a framework for the design of the assessment model. The literature study included the following areas as related to the research problem, questions and objectives as set out in Chapter 1:

- Process, Business Process Management and Business Process Management Critical Success Factors;
- Strategy (regarding Business Process Management as a Critical Core Capability);
- Governance and governance factors (regarding Business Process Management as a Critical Core Capability);
- Measurement (regarding Business Process Management as a Critical Core Capability);
- Assessment of Business Process Management and assessment models;
- Development of a Business Process Management Competency Assessment Model; and
- Critical Core Capabilities, Balanced Scorecard, Excellence Models, etcetera.

Figure 2.1 sets out the areas of research in order to gain a better understanding of the scope and context of the study with the primary focus on the Critical Core Capabilities within each field.

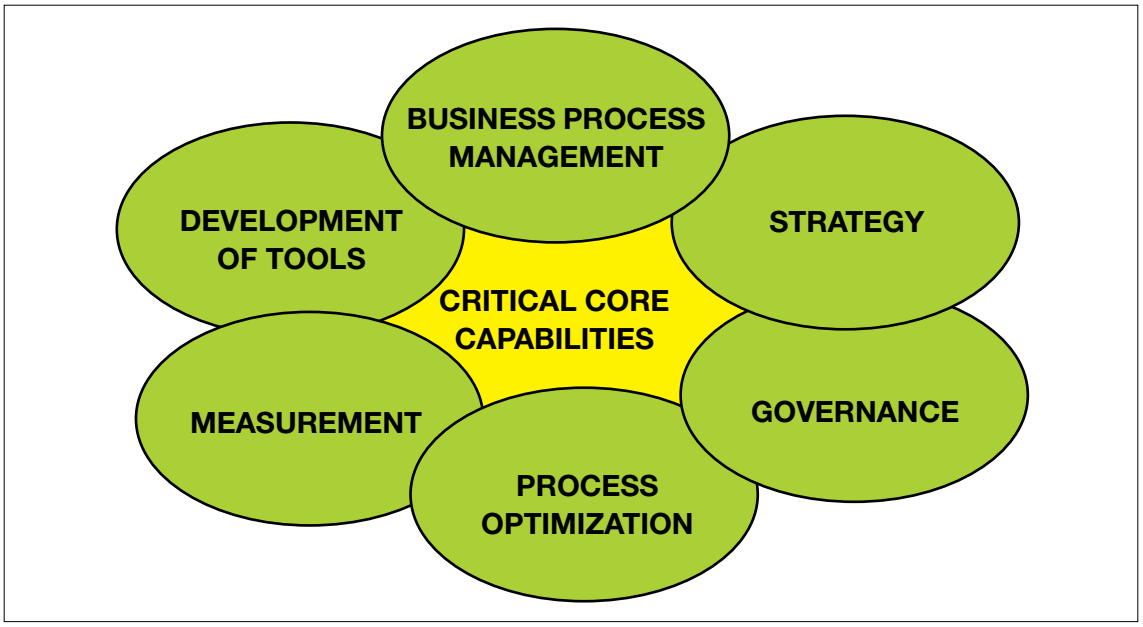

Figure 2.1 Areas of Research (Defined by Researcher)

2.2 DEFINING OF KEY CONCEPTS

The following definitions as obtained from the reviewed literature are proposed to define the key concepts and clarify their meanings for the purposes of this study. It is extremely important to constantly view the research findings within the context of Business Process Management as a Critical Core Capability and not as an operational function in isolation.

2.2.1 Definition of Critical Core Capabilities

Prahalad and Hamel (1990:79-91) define Critical Core Capabilities as "The collective learning in the organization, especially how to coordinate diverse production skills and integrate multiple streams of technology."

Stahl and Dean (1999) propose a similar definition when they define Critical Core Capabilities as being "an integrated bundle of skills and technologies that contribute to an organization's competitive success."

According to Khade (2003), "true competitiveness is derived from an ability to build or serve at lower costs and move faster into the market place than competitors." The author is of the opinion that real sources of competitive advantage are to be found in "management's ability to consolidate corporation-wide technologies and production skills into competencies that empower individual businesses to adapt to changing opportunities." He further argues that, "if an organization has the competencies and the organizational ability to create the process/product innovation move-down the experience curve quickly, the chances of adapting to changing opportunities would be higher." In view of the above definitions it is clear that, in order to classify Business Process Management as a Critical Core Capability, the functionality should include the necessary skills and technology and should be integrated with the other Critical Core Capabilities within the organization.

2.2.2 Definition of Criteria

The Oxford Advanced Learner's Dictionary (2003:276) defines criteria as "standards or principles by which something is judged or with the help of which a decision is made."

2.2.3 Definition of Critical Success Factors

The Information Systems Audit and Control Foundation (2000:8) states that Critical Success Factors "define the most important issues or actions for management to achieve control over within its business process control processes. Critical Success Factors are management-oriented implementation guidelines that identify the most important things to do, strategically, technically, organizationally or procedurally."

Dobbins (2002) defines Critical Success Factors as "areas of activity that should receive constant and careful attention from management." He states that, "unless the Critical Success Factors are stated in the form of an activity, applying the Critical Success Factors to a given program presents many problems." According to the author, Critical Success Factors are "activities, not goals. They are therefore critical to achieving overall success and require personal attention from the manager."

In addition, he states that a fundamental premise of the Critical Success Factors theory is that "if an activity is identified as critical to success, and the manager's time is focused on this activity and resources are expended to execute, evaluate and measure this activity, the organization is at reduced risk. Conversely, if an activity being given significant attention by a manager is in fact not critical to success, and precious manager activity and attention is thereby being drawn away from items that actually are critical to success, and therefore do require manager attention, the organization is at increased risk."

Taking the above discussions into consideration, it is critical to the success of any function that management acknowledge, identify and gain control over the Critical Success Factors within the functionality under their control. Management responsible for the Business Process Management functionality within an organization therefore should follow suit.

Critical Success Factors will form the basis of the proposed assessment model's criteria. Critical Success Factors will therefore be identified on the basis of the evidence found within the literature for every criterion to be included in the proposed assessment model.

2.2.4 Definition of Business Process Management

Business Process Management is often defined to relate to either the IT functionality or the Business Process Improvement functionality. Various authors, however, define the concept more broadly to include aspects such as people, management functions, systems and infrastructures.

According to Hunt (1996:10), Business Process Management "reaches beyond just the process." He clearly states that "even the most logical, goal-directed processes do not manage themselves" and that the following four components should form the basis for effective Business Process Management:

- "Process goal management;
- Performance management;

- Resource management; and
- Process interface management."

2.3 BUSINESS PROCESS MANAGEMENT AS A CRITICAL CORE CAPABILITY

Business Process Management, as a concept, has several different meanings. Many authors, however, suggested that Business Process Management entails some or all of the management functions – planning, organizing, leading, and controlling as well as the technical aspects of Business Process Management as a strategic, tactical and operational function in relation to the management of a Critical Core Capability.

In order to gain an holistic understanding of this concept as denoted in this study, Business Process Management will be discussed according to all the sub-parts as identified within the literature.

The term Business Process will be discussed in full later in this chapter. The discussion below will focus on the "Philosophy" and "Management" aspects of Business Process Management.

2.3.1 Management

According to Dessler (1981:1), "the management process involves five basic functions that managers perform. These are planning, organizing, staffing, leading and controlling, and in total they represent what is often called the "Management Process". Ivancevich et al. *(2005:9)* list the management functions according to the work of Henri Fayol as planning, organizing, commanding, coordinating and controlling. Some of the specific activities involved in each function include:

- "**Planning:** Establishing goals and standards; developing rules and procedures; developing plans and forecasting; predicting or projecting some future occurrence;
- **Organizing:** Giving each subordinate a separate task; establishing departments; delegating authority to subordinates; establishing channels of authority and communication; coordinating the work of subordinates;
- **Staffing:** Deciding what type of people should be hired; recruiting prospective employees; selecting employees; setting performance standards; compensating employees; evaluating performance; counselling employees; training and developing employees;
- **Leading:** Getting others to get the job done; maintaining morale; motivating subordinates; and
- **Controlling:** Setting standards; checking to see how actual performance compares to these standards; taking corrective action if needed."

Brigham, Gapenski and Ehrhardt (1999:8) add to the relevance of management tasks in that they argue that "Financial Management might be the most important critical performance area for an organization's management to have control over." The major responsibilities that go hand-in-hand with financial management are:

- "Forecasting and planning;
- Investment and financing decisions;
- Coordination and control;
- Dealing with financial markets; and
- Risk management."

The authors further state that, “within every organization, most of the financial responsibilities are being performed on either strategic, tactical, operational or project level.”

Within the Business Process Management environment, financial management refers to both the financing of the staffing function, as well as the financing of improvement projects.

Considering the above discussions it is most important that the five basic functions that managers perform are entrenched and visible within the Business Process Management functionality for the functionality to be classified as a “Management” functionality.

The difference between Business Process Management and general management is found in the fact that Business Process Management, in addition to the management task, also includes the ‘management’ (input, throughput and output) of business processes on all three organizational levels.

2.3.2 Business Process Management Philosophy

As stated earlier, different people define the concept Business Process Management differently. The following quoted passages identify and describe the views and critical performance areas linked to Business Process Management as a philosophy.

In support of the above, Dobbins (2002) identified that “a subtle yet substantive change has occurred in the Business Process Management area since the initial understanding of Business Process Management as a “once off” performance enhancement exercise.” He indicates that “it is mainly visible in the fact that Business Process Management has been elevated to the status of a core capability, which - in turn - emphasizes the continuous nature of the functionality.” He further also indicates that, “irrespective of the aforementioned elevation of the function, most organizations still do not see Business Process Management as a full-time portfolio that requires exactly the same infrastructure and attention as any other core capability.”

Ostroff (1999:13-18) also acknowledges that “major changes have occurred during the last few years as significant learning has taken place about managing process performance, which is in effect managing the horizontal organization.” He is of the opinion that, “if processes were to be managed effectively and proactively on an ongoing basis, and not just “fixed when they break”, managers should establish an infrastructure, known throughout the organization as Business Process Management.”

Harter (2004) emphasizes “the relationship that should exist between a function and its business processes as well as the negative impact resulting from non-alignment of functionalities and their business processes.” He states that “in many industries, particularly within the financial services domain, the quality of customer care often is the difference between success and failure.” He feels that “many organizations’ efforts to improve customer service are unfortunately plagued by ineffective, misunderstood, or broken business processes.”

For Tucker (1999:8), “successful Business Process Management is as much about raising the performance and capabilities of people, systems and structures as it is about improving the process.”

Smith and Fingar (2003:52) identified "an important shift that took place within the Business Process Management functionality over the past years regarding the elevation and consolidation of the functionality." They claimed, "While the vision of Business Process Management is not new, existing theories and systems have not yet been able to cope with the reality of business processes – until now." They believe that "by placing business processes on center stage, as first class citizens in computing, corporations could gain the capabilities they need to innovate, reenergize performance, and deliver the value today's markets demand." According to their theory, in The Third Wave, "both strategic principled processes and all supporting processes must be managed as a whole and within one environment."

Devane (2004:xxvii-xxviii) claims that "the serious crisis that organizations face today is in the execution and sustainability of improvement programs." He indicates that "experience and research have shown that these two areas are the most troublesome for settling improvement and innovation within an organization." According to his research, "the ability to execute – both strategic and improvement plans – is a highly sought after skill in executive offices these days."

He states that "for many organizations the element of sustainability remains equally as elusive as execution." He acknowledges that "it is not uncommon for improvement efforts to start off with a bang and end with a whimper only six to nine months later."

Devane (2004:130) is further of the opinion that "to sustain an organization, several performance factors must be present and actively maintained within an organization's internal environment, i.e. strategy, process, information, learning, Human Resources practices, culture, structure and relationships."

MacArthur (2004) identifies "major changes that recently occurred in Business Process Management where the focus has shifted to managing activities within the context of processes and sub-processes." He further states that, "if managers focus on improving individual activities rather than an entire set of activities within processes and sub-processes, sub-optimization could occur. Sub-optimization is defined as being one part of the system (production) at the expense of another (service and customer satisfaction)."

Hunt (1996:10) most emphatically states that "even the most logical, goal-directed processes do not manage themselves." He advocates that "there are four components of effective Business Process Management as well as certain set actions needed to sustain the Business Process Management functionality i.e.:

- Process goal management;
- Performance management;
- Resource management; and
- Process interface management."

Business Process Management actions include:

- "Grade and rate process performance;
- Designate process owners to oversee total process;
- Identify permanent process teams which meet monthly to review and improve processes;

- Conduct monthly operational reviews in which process performance will be reviewed first; and
- Reward people according to the process performance and if goals are met. "

The Centre of Strategic Leadership Studies (1996:11) stresses that Business Process Management "involves the leadership actions required to begin and sustain continuous improvement of significant processes."

To Juran and Godfrey (1998:6.1) "the success in achieving business goals and objectives depends heavily on large, complex, cross-functional business processes." They are of the opinion that "in the absence of management attention and over time, many of the processes become obsolete, overextended, redundant, excessively costly, ill-defined and inadaptable to the demands of a constantly changing environment." They emphasize that "processes eventually fall short of the desired quality for sustained competitive performance."

According to Khade (2003), "one of the key factors to the success of Business Process Management as a Critical Core Capability is the culture of the organization as far as their ability and need to become a process-centric or process-driven organization is concerned."

Wheelen and Hunger (1986:A56) claim that "corporate culture is a collection of beliefs, expectations and values shared by the organization's members, that act to shape the behavior of people in the organization. Corporate culture may strongly affect the implementation of new strategies and therefore employees will quietly sabotage a strategy that contradicts an entrenched culture."

2.3.3 Conclusion on Business Process Management Philosophy

Through the analysis of the literature on the philosophy of Business Process Management, several key areas were identified, i.e. the act of improving business processes, the continuous nature of Business Process Management, the need for a supportive infrastructure, alignment with other functions, the raising of performance of people, system and process, the need for sustainability and executing the present performance factors.

This clearly emphasizes that Business Process Management entails more than just once-off reengineering, changing of the process, or process management within an IT system. Sufficient proof was found in the literature that authors perceive Business Process Management as an enterprise-wide management tool that must become "the way we do things around here" – a philosophy and culture. The main themes identified within the above statements are the fact that the generic management functions must be actively and visibly practised to ensure sustainability and permanence of such management functions within the management of business processes.

The basic premise of the Business Process Management model is therefore that the term Business Process Management includes a philosophy that the generic management functions (planning, organizing, staffing, leading and controlling) are needed to install a quality culture and to continuously manage and control the areas and functions that oversee the enterprise's business processes as a Critical Core Capability.

2.3.4 BPM Philosophy-related Critical Success Factors

With reference to the earlier discussion, Critical Success Factors form the cornerstones within every functionality or process. If they are not identified, executed and evaluated, the organization is at risk. Although rarely discussed comprehensively in any publication regarding Business Process Management, various Critical Success Factors were identified within the literature and will be highlighted within this chapter under the appropriate headings.

On the basis of the evidence found within the literature, the following Critical Success Factors related to the philosophy and management principles of Business Process Management were identified:

- Business Process Management must be elevated to the status of a Critical Core Capability in the organization;
- Business Process Management Critical Success Factors must continuously be identified, executed, sustained and evaluated on the strategic, technical, and organizational levels;
- Behaviors, values and standards that are desired in the Business Process Management environment must be identified, communicated, accepted and visibly demonstrated in the organization;
- Business Process Management must be a continuous full-time portfolio with exactly the same infrastructure and management attention and actions as other Critical Core Capabilities;
- The Business Process Management portfolio must entrench the five basic functions that Managers perform (planning, organizing, staffing, leading, and controlling) to raise the performance of people, systems and structures;
- Business Process Management must be implemented enterprise-wide spanning the horizontal organization and end-to-end processes; and
- A process-oriented business culture must be established, encouraging cross-divisional cooperation, teamwork and Continuous Process Improvement.

2.4 MANAGEMENT PRINCIPLES WITHIN PERFORMANCE ENABLERS

It is important to analyze the most prominent and established Performance Enablers that have shown success and durability over an extended period to establish which management principles are seated within these models. It is important that these principles be included in the proposed BPMCAM to enhance the model's credibility and success.

2.4.1 Introduction

Ostroff (1999:10-11) indicates that "since the 1980s, a broad raft of innovations such as BPR, Project Management, TQM, Kaizen, Just-in-Time, Six Sigma, Lean Sigma and Business Process Redesign have become increasingly popular as managerial devices for improving production and distribution within service industries. These innovations are also referred to as Performance Enablers."

Knights and McGabe (1999) state that "the popularity of the Performance Enablers has been stimulated by a number of factors, including intensified competition, the search for competitive strategies that could not be imitated, consultancy fashion, and guru populism."

Over the past few decades, there have been sufficient writings and practical examples available to prove that every innovation, either during its inception or later, had some measure of success, but none of them retained the "one-and-only" sustainable competitive edge for any industry or environment. Organizations have jumped on and off the bandwagon of different innovations rapidly

and frequently – but have come to the realisation that there is only value in a technique or enabler as long as the technique or enabler and its key drivers are applied appropriately, are supported by adequate structures and are maintained by dedicated resources.

The different management principles within the following Performance Enablers will be analyzed in order to identify the attributes that enhance success or the lack of such attributes:

- BPR;
- TQM;
- Six Sigma; and
- Lean Sigma.

2.4.2 Business Process Reengineering

Pellissier (1999:2) concluded that "almost all the definitions on BPR emphasize a common theme, ***"Radical redesign of processes"***, although some more revolutionary and others more evolutionary." She summarizes the definitions of BPR via a consolidation of different authors' views as:

"Analysis and ***design*** of strategy and business ***processes*** to seek improvements" (Davenport and Short, 1990). "Fundamental re-think and ***radical redesign*** of ***processes***" (Hammer and Champy, 1993). Rapid and ***radical redesigning*** of strategic value-added business ***processes***/systems" (Mangenelli and Klein, 1994). According to Kim (Pellissier 1999:2) "Changing the way of doing business, maximize benefits of IT". Summarized by Fiedler et al., (Pellissier 1999:2) "***Radical*** alteration, departing from existing practice/business ***processes***, deliberating to plan". "***Radical***/breakthrough change in key value business ***processes***" (Dixon, Arnold, Heineke, Kim and Mulligan, 1994). "Critical analysis and ***radical redesign*** of existing business ***processes***" (Teng, Grosvenor and Fiedler, 1996). According to Baines (Pellissier 1999:2) "Challenge existing work procedures/***processes*** and overturn old assumptions". "***Redesign*** and re-organization of business activities, question status quo, achieve specific objectives, breakthrough improvement, significant cultural and technological changes" (Sethi and King, 1998).

Schein (2002:8) agrees that BPR "is a process-based tool to achieve once-off dramatic improvements after merger-related Business Process Management projects", but argues that "to concentrate on processes alone, is not enough, and does not constitute success." He states that "the evidence from both research and the testimony of executives at conferences and seminars suggested that, even under favourable financial conditions, there were persistent problems of culture, organization, Human Resources and systems that caused deals to fall apart or, if consummated, presented with severe management problems."

Hammer and Champy (1993:217-218) argued that "given the enormous failure rate of BPR projects (±50-70%), it is easy to blame the BPR methodology." They further argued that "BPR has become the scapegoat for management failure in achieving results, because people undertaking the programs made common, avoidable mistakes." Within the context of the above they offer the following advice to organizations who want to succeed at reengineering:

- "Do not neglect people values;
- Do not settle for minor results;
- Senior Management Leadership must be knowledgeable on the process and methodology;
- BPR must be at the top of the agenda;

- Do not skimp on resources;
- Do not dissipate resources over many projects; and
- Do not attempt to reengineer if top management will not last the course."

Al-Mashari and Zairi (1999) within their comprehensive study of BPR identify the following factors that are critical to success within any BPR project:

- "Committed and strong leadership;
- Championship and sponsorship;
- Effective BPR teams;
- Effective communication;
- Creating an effective culture for organizational change;
- Stimulating the organization's receptiveness to change;
- Management of risk;
- Empowerment;
- Revising reward and motivation systems; and
- Appropriate job definitions and allocation of responsibilities."

2.4.3 Total Quality Management

According to Duncan and Van Matre (1990), "Dr. W. Edwards Deming (1900-1993), one of the principle figures related to TQM, was a physicist and statistician who developed a management philosophy for improving quality. The principal elements of the philosophy came from the (a) theory of variation; (b) application of systems theory to managing organizations; (c) psychology of work; and (d) use of the scientific method to pursue optimum mission performance."

They subscribed to the broad understanding of TQM which Hill and Wilkinson (1995:8-25) have summarized as "a philosophy that is customer and process orientated and concerned with continuous improvement."

Similarly, Dean and Bowen (1994:392-419) have indicated that "organizations should have three key principles, practices and techniques that include continuous improvement, team work and customer focus." They state that "there are a number of different theoretical approaches to TQM. Implicit in the work of the quality gurus such as Crosby, Deming and Juran (Dean and Bowen 1994:392-419) is a rational view of organizations and management which assumes that management can plan and achieve "conformance to requirements" or a constancy of purpose and that organizational outcomes will match management's desired intentions and objectives."

Carson and Carson (1993) explained that "these gurus generally see quality as a positive aspect, which employees will welcome and that resistance is usually viewed by them as irrational or, at best, misplaced."

The Three Components of the Deming Philosophy

According to the work of Hill and Wilkinson (1995:8-25), "Deming's quality philosophy is based on profound knowledge, leadership principles and the learning cycle. The system of profound knowledge leads to the practice of those principles that, in turn, lead to the use of the learning cycle (also known as the continuous improvement cycle or the 'Plan-Do-Check-Act (PDCA)' cycle)."

System of Profound knowledge

"Profound knowledge provides the ability to understand and improve organizations. It is made up of four interrelated parts: (1) *theory of knowledge* (the development, testing and application of hypotheses), (2) *theory of variation* (identifying factors and interactions that affect quality through measurement and analysis of data), (3) *general systems theory* (understanding of and dealing with the dynamics of internal organizational components and the interrelationship of an organization with its external environment), and (4) *psychology in the workplace* (finding and using effective teaching, communication, incentives, and teamwork skills). According to the authors, Deming indicated that one needs not be an expert in any one of these areas, but rather have a working knowledge of all four areas to effect process improvements."

Viewing and Managing Organizations as Systems

The authors stated that "a fundamental premise of Deming's theory of quality management is that an organization behaves as a system. Organizational effectiveness is most prevalent when the parts of that system work well together to achieve an aim or mission. Such a system is then optimized. There are several very important implications from viewing an organization as a system. System optimization requires that an organization is led and managed to focus on the aim of the organization. Without an aim, the organization's activities can become scattered or internally focused."

The Quality Culture Pyramid

According to Johnson (1993:39), "definite cultural changes must underlie the way the organization views quality as well as the way workers are viewed by the organization - it must become the "Team" with top-down leadership power and energy." To the author the following premises are crucial to the envisaged "change":

- "Vision, mission, objectives and goals direction;
- Quality philosophy – reason why;
- Quality policy – course of action;
- Process understanding – knowledge of the operations;
- Quality work environment – support;
- Awareness involvement and commitment – conviction;
- Continuous training skills and quality;
- Quality actions – confidence and pride;
- Process ownership – possession;
- Quality results – incentive; and
- Recognition and reward benefits."

Duncan and Van Matre (1990) stated that their view of Deming's work leads them to conclude that "his 14 points, seven deadly diseases, and obstacles can be classified under the following six general headings that have represented recurring themes in management thought":

Purpose and Mission of Business Organizations

"As with any philosophy of management, the first issue that must be addressed is the purpose of the organization. Moreover, the issue of purpose must be addressed on two levels, as is illustrated in Deming's theory. The first level relates to constancy of purpose; the second focuses on the pursuit of a specific purpose."

Quantitative Goal Setting

According to Duncan and Van Matre (1990), "the most convincing case for goal setting comes from behavioral research." Locke, Shaw, Saari, and Latham (1981:125-152) surveyed more than 100 organizations and concluded that "in 90 of them, goal setting was key to significant increases in performance."

Philosophy Rather than Technique

Duncan and Van Matre (1990) further acknowledge that "Deming talks of quality as a new religion and that his emphasis is on philosophy rather than on technique. Deming carefully points out that neither gadgets, automation and new machines, nor mass inspections or unmanned computers that no one knows how to use, will solve the problems of today's industries. Although good techniques are essential, Deming argues that the best techniques will fail within three years if top management is not philosophically committed to them."

Instruction and Training

"If there is to be a mental revolution, there must be training and instruction. The importance is recognized by the manager in instructing workers in the proper ways of doing things."

Manager/Worker Relations

Duncan and Van Matre (1990) stated that "Deming maintained that leadership should be a helping relationship rather than an authoritarian one." They suggest that "successful organizations reveal a propensity to act innovatively and creatively, pursuing continuous improvements through experiment and persistence."

Wilkinson, Snape and Snape (1991:24-31) argue that "the form and content of TQM will be subject to management's concern with profits. Notwithstanding this, it was argued that TQM offers an opportunity for management to change staff attitudes and possibly the nature of the employment relationship. The failures of TQM are attributed to it being bolted onto an organization, to the threat it poses to management, and to management's failure to consider industrial relations (i.e. trade unions, resistance, and conflict)."

Anderson, Rungtusanatham and Schroeder (1994:472-509) pointed out that the TQM philosophy has four basic aspects:

- "Firstly, it has a customer focus - TQM emphasizes the improvement of processes for both internal and external customers;
- Secondly, as stated by Senge (1990:14), TQM emphasizes continuous improvement. It advocates a culture in which people are not satisfied with meeting current standards but, rather, push to exceed those standards. The emphasis is on raising standards by comparing one's efforts with the best in the industry or in the world. At the heart of continuous improvement is the notion of the learning organization i.e. continuous improvement is achieved through constant experimentation, learning from mistakes and diffusing the learning throughout the organization;
- Thirdly, as phrased by Deming (1994), TQM involves structured, problem-solving processes for identifying and solving problems and finding opportunities for improvement; and
- Finally Anderson et al. (1994:472-509) indicated that TQM emphasizes employee empowerment. A major tenet of the TQM philosophy is that continuous improvement is most likely to occur with

groups of individuals who are provided with not only knowledge, skills, and motivation but also with the authority to take action."

In summary Duncan and Van Matre (1990) argue that "to Deming, nothing short of a new way of thinking will suffice. The needs of customers must be constantly considered. Improvements in production and service are essential. Most importantly, rather than trying to inspect quality problems, the firm must build quality into every stage of production, beginning with the purchase of high-quality raw materials. Mistakes should be eliminated by adopting a new philosophy that demands quality and excellence at all stages of production."

2.4.4 Six Sigma

Eckes (2001:22-32, 63-72) describes Six Sigma as "a management philosophy inclusive of the following aims and principles":

- "Attempts to improve customer satisfaction to near perfection;
- Moves an organization towards managing facts and data;
- Achieves greater levels of customer satisfaction through focus and management of the processes of such an organization;
- Is exclusively the domain of executive management with a set of tools that is designed to support the corporate bottom line;
- Is an optimized level of performance approaching zero defects in a process that produces a product or service;
- It indicates achievement and maintenance of world-class performance;
- It includes the following:
  - Vision: Being the best in the world;
  - Philosophy: Working smarter, not harder, resulting in fewer mistakes;
  - Method: Tools and processes to reduce variation;
  - Metric: Based on standard deviation; how capable is the process;
  - Benchmark: Six Sigma is the "best in class" (Four Sigma is average); and
  - Goal: Defect rate reduced to 3.4 per million opportunities."

Abramowich, (2005:4) indicates that "Six Sigma has organized well-known and well-established tools such as control charts and systems thinking into a systematic improvement methodology with the following tool set":

- "Focusing on customers;
- Using proven tools;
- Delivering results that matter to the business; and
- Integrating process improvement into the business."

2.4.5 Lean Six Sigma

According to DeCarlo (2007:3-4), "Lean Six Sigma is a body of knowledge and tools organizations use to remove all non-value-added time and activity (or waste) from their processes. The roots of Lean are traced back to the early days of mass production (1910) and Henry Ford, who enacted the groundbreaking work of Fredrick Taylor (scientific management) and Frank Gilbreth (father of industrial engineering)."

DeCarlo (2007:304) proposes the following steps to be performed by leadership when embarking on Lean Six Sigma projects:

- "Establish Deployment Objectives
  - Design overall objectives;
  - Design current year priorities; and
  - Design deployment organization.
- Engage Leadership Support
  - Secure Executive sponsorship;
  - Demystify Lean Six Sigma Approach;
  - Engage deployment champions; and
  - Engage champions and process owners.
- Install Deployment Infrastructure
  - Support strategies for Human Resources;
  - Support strategies for Finance;
  - Support strategies for IT;
  - Support strategies for Project Management;
  - Support strategies for Training; and
  - Support strategies for Communication.
- Design Governance Model
  - Design Governance Framework and Matrix;
  - Establish long-term Lean Six Sigma Practitioner strategies;
  - Establish Lean Six Sigma Practitioner selection process;
  - Identify and engage Lean Six Sigma Practitioner;
  - Align projects and people; and
  - Set individual performance objectives."

In conclusion, it is clear that the one overarching thought that underlies the Performance Enabler philosophy is the completeness and comprehensiveness of the scope and focus of the philosophies, i.e. people, culture, system, structure, planning, objectives, process and governance on all levels of the organization.

2.4.6 Literature-related Critical Success Factors: Performance Enablers

Evident from the above researched literature on performance enablers (par 2.4.2 – 2.4.5), the Critical Success Factors represent principles within the different Performance Enablers that contribute to success. The inclusion of these Critical Success Factors in the proposed BPMCAM is essential:

- The Performance Enabler must be a philosophy accepted by the total organization;
- Senior management must visibly demonstrate strong commitment, ownership, and sponsorship of the Performance Enabler philosophy;
- The total workforce must be knowledgeable regarding the Performance Enabler;
- The Performance Enabler philosophy must enable and support the empowerment of the workforce;
- Management must establish clear goals for the organization regarding the Performance Enabler philosophy and process in general; and
- The Performance Enabler philosophy must create and stimulate an effective culture for organizational change.

2.4.7 Combined Critical Success Factors for Business Process Management as a Philosophy and Management Tool

Considering the principles regarding Business Process Management (Par 2.3.4) and Performance Enablers (Par 2.4.6) as philosophies and management tools the following Critical Success Factors can be denoted as a combination of the previous two sets of Critical Success Factors. The following Critical Success Factors will then be accepted to be included in the proposed BPMCAM:

- Business Process Management must be elevated to a Critical Core Capability with management buy-in and commitment on all levels;
- Business Process Management must be perceived and accepted as an enterprise-wide philosophy and culture with desired behaviors, values and standards identified, communicated and visibly demonstrated;
- Business Process Management must be practised as a continuous and full-time management function (inclusive of the other management functions) with a dedicated infrastructure that spans the horizontal organization;
- Business Process Management must create and stimulate an effective culture for organizational change;
- Business Process Management must enable and support the empowerment of the workforce; and
- The total workforce must be knowledgeable regarding Business Process Management.

2.4.8 The Proposed BPMCAM

Eleven criteria have been identified as being the most important areas to be included in the Business Process Management functionality. According to the eleven criteria, a framework has been constructed in order for the reader to form an holistic picture of Business Process Management and to enhance the reader's understanding of the total subject matter that constitutes the subject Business Process Management as gathered from the reviewed literature. To guide the reader, the discussions in this chapter will be structured according to the eleven criteria as identified and as displayed in figure 2.2. The framework will form the basis of the BPMCAM.

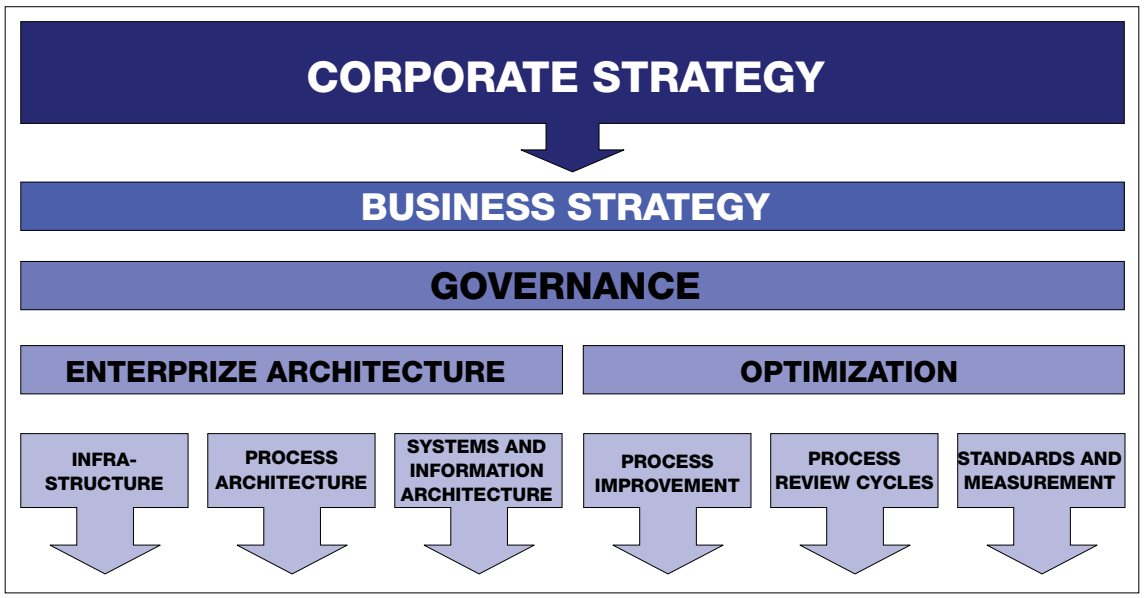

Figure 2.2 BPMCAM Model (Defined by Researcher)

2.5 STRATEGY AND STRATEGIC MANAGEMENT

The researched authors (Duncan and Van Matre, 1990; Galbraith, 1995:12; Devane, 2004:183; Wheelen and Hunger, 1986:A24-A25) emphasize the importance of goal setting by means of a formal strategic process within every organization for every business function and core capability. They emphatically stated that, as with any other Critical Core Capability, an organization must also set the direction that the organization's Business Process Management will follow in order to ensure that everyone in the organization understands the vision and aims of Business Process Management.

Duncan and Van Matre (1990) argue that "leaders set the aim and direction for the organization by clarifying (1) the *mission* – why the organization exists, whom it serves and what it provides, (2) the *vision* – a view of the organization that addresses needs of the end-users in the future, and (3) *guiding Principles* – a reflection of the values of the organization, the quality philosophy, and how these values are to be employed in day-to-day management to achieve the goals and objectives. Leaders need to ensure that plans contain measurable milestones so that progress can be tracked."

Galbraith (1995:12) is of the opinion that "strategy is the organization's formula for winning." He further states that "the organization's strategy specifies the goals and objectives to be achieved as well as the values and mission to be pursued; it sets out the basic direction of the organization. The strategy specifically delineates the products or services to be provided, the markets to be served, and the value to be offered to the customers. It also specifies sources of competitive advantage and strives to provide superior value."

Devane (2004:183) points out that, "when the organizational direction is being defined, the organization develops detail of its strategy, specifics on how it will achieve its strategy, articulates the transformation effort guidelines and boundaries, and charts a course for the development of resources on all levels to achieve the goals."

Wheelen and Hunger (1986:A24-A25) claim that "strategy formulation is typically not a regular or continuous event. It is more of an irregular discontinuous process that can be performed once a year." They also point out that "the hierarchy of strategy is a term that is used to describe the interrelationships among the three levels of strategy (corporate, business and functional) typically found in large organizations. This means that corporate level objectives, strategies and policies form a key part of the environment of a division or Strategic Business Unit (SBU). The objectives, strategies and policies of the division must therefore be formulated to help achieve the plans of the corporate level. The same is true for a functional department which must operate within the objectives, strategies and policies of a division or SBU."

Wheelen and Hunger (1986:A24-A25) further argue that "Strategic Management is that set of managerial decisions and actions that determine the long-run performance of a corporation. It includes the formulation and implementation of strategy as well as the evaluation and control of corporate performance. Strategic management incorporates the more-internally-orientated integrative concerns of business policy with a heavier emphasis on environmental and strategic concerns."

As the authors point out, the organization formulates strategy for all Critical Core Capabilities. This then also holds true for Business Process Management.

2.5.1 Critical Success Factors specific to Strategy

When the importance of strategy formulation for any Critical Core Capability of an organization is evaluated it is clear that this is one area over which management must have full control. The generic strategic statements were therefore rephrased into the following Critical Success Factors specific to Business Process Management and are tabled to be included in the proposed BPMCAM:

- The Business Process Management organization must be structured to deliver the relevant policy and strategy needed on all levels;
- Management commitment in the development of Business Process Management strategy must be visible and communicated;
- The Business Process Management strategy must be translated into strategic business plans that use policy and strategy as the basis for planning of activities and setting of objectives throughout the organization;
- The Business Process Management strategic planning process must balance the needs and expectations of all the stakeholders;
- The Business Process Management strategy must balance short- and long-term pressures and requirements;
- There must be an enterprise-wide evaluation of people's awareness of the Business Process Management policy and strategy regarding overall policy and policy specific to their own processes; and
- Business Process Management policy must regularly be reviewed, updated and improved.

2.6 GOVERNANCE

The Oxford Advanced Learner's Dictionary (2003:514) defines Governance as "The activity of governing a country or controlling a company or organization; the way in which a country is governed or a organization is controlled".

According to the Oxford Advanced Learner's Dictionary (2003:250-251) Control is defined as "The power to make decisions about how a country, an area, an organization, etcetera is run"; "The act of restricting, limiting or managing"; "A place where orders are given or checks are made"; "Management, administration and direction".

According to the Oxford Advanced Learner's Dictionary (2003:824) Organization is "A group of people who forms a business, a club, etcetera".

Therefore, Governance refers to the act of management, administration, direction and decisions about how an area or an organization will function and be controlled to achieve a desired outcome. The definition of "Governance" as applied to this study is a comprehensive rephrased statement derived from the literature revised to fully define the concept as meant in the "Governance" of the Business Process Management area and functionality:

"Governance is the defining, implementing, and maintaining of a strategy (inclusive of policy, process, rules and responsibilities) on how the identified criteria and Critical Success Factors will be monitored and controlled within an organization's total business processes environment and value chain."

Business Process Management governance is further the responsibility of executives and shareholders.

It is a system of control that ensures that the business objectives are achieved. This usually consists of directing the organization's Business Process Management endeavors after reviewing its reported performance against some simple norms that call for:

- Business Process Management to be aligned with the business;
- Business Process Management to enable the business and maximize its benefits;
- Business Process Management resources to be used responsibly; and
- Business Process Management-related risks to be managed appropriately.

Smit (2000:2) identifies within his work that the following concepts are included in what is called Business Architecture. "Business Architecture is the representation of the business unit's key business strategies and their impact on business functions and processes. Business Architecture typically consists of the current and future-state models of business functions, processes and business value chains that include Governance":

- "Principles and policies;
- Roles and responsibilities;
- Standards and procedures;
- Models and meta data; and
- Repositories and tool sets."

2.6.1 Critical Success Factors specific to Governance

Due to excessive regulatory requirements (with heavy penalties for non-compliance) issued over the past decade, industries in South Africa have become almost over-legislated and controlled. Governance that incorporates the upholding of a control environment has become a major focus area within organizations. It is therefore extremely important that Management maintain control over the Business Process Management function as it is via business processes that the organization impacts the external environment and all other stakeholders. The following Critical Success Factors to be included in the BPMCAM were derived from the literature reviewed and rephrased to suit the Business Process Management environment:

- The Governance function must include the upholding of a control environment that assesses compliance and adherence to established standards, via formal assessment and self-assessment practices;
- Business Process Management governance must be recognized and defined, and its activities must be integrated into the enterprise governance process, providing clear direction for Business Process Management strategy and policy;
- Policies and procedures relating to compliance with internal and external requirements must have been documented and communicated;
- Compliance should be reviewed and monitored within the total organization; and
- A formal reporting process to the relevant governing body must be in place supported by processes to rectify non-compliance.

2.7 ENTERPRISE ARCHITECTURE

From the literature it was clear that authors view organizations holistically, inclusive of policy, people, process and structure. Within the literature this totality was frequently referred to as "Enterprise Architecture".

Fox and Gruninger (1998) state that "an enterprise model (architecture) is a computational representation of the structure, activities, processes, information, resources, systems, people, behavior, goals and constraints of a business, government, or other enterprise. It can be both descriptive and definitional - spanning what "is" and what "should be". The role of an enterprise model is to achieve model-driven enterprise design, analysis, and operation."

The above authors further emphasize that "from a design perspective, an enterprise model should provide the language used to explicitly define an enterprise. Organizations need to be able to explore alternative models in the design of enterprises spanning organization structure and behavior. From an operations perspective, the enterprise model must be able to represent what is planned, what might happen, and what has happened. It must supply the information and knowledge necessary to support the operations of the enterprise, whether they are manual or automated. The enterprise model should provide answers to questions commonly asked in the performance of tasks."

Based on the literature, Enterprise Architecture includes Infrastructure, Process Architecture, and Systems and Information Architecture supported by numerous Critical Success Factors (See figure 2.3).

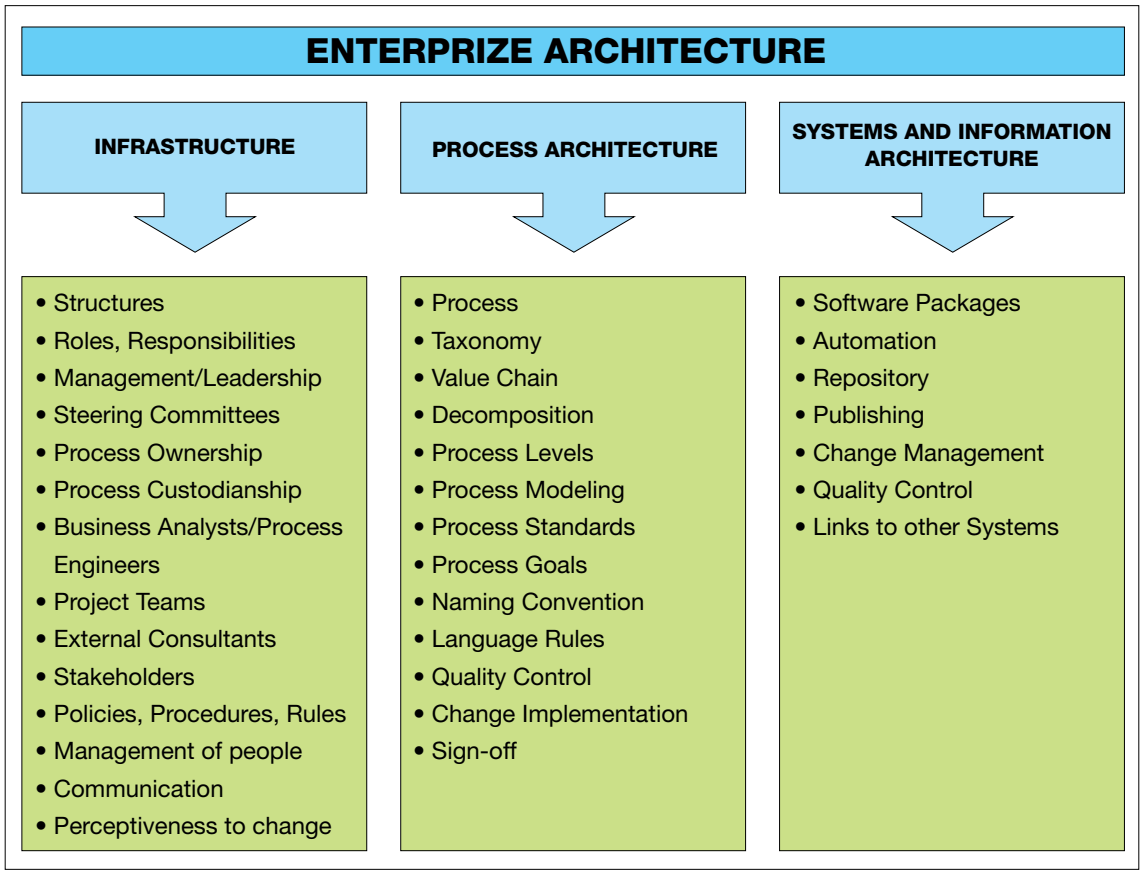

Figure 2.3 Decomposition of the Criteria Enterprise Architecture (Defined by Researcher)

Within the environment defined as infrastructure in the BPMCAM is seated the critical performance areas that intimately impacts the individuals social and psychological needs within his interactions with his "work". According to Robbins (1998:19) the employee's psychological needs will include

"learning, motivation, training, leadership effectiveness, job satisfaction, individual decision making, performance appraisal, work design and work stress." While the employees social needs will include "group dynamics, work teams, communication, power, conflict and intergroup behavior."

To the researcher the critical performance areas in this criterion in the BPMCAM therefore becomes the platform where leadership will either positively or negatively impact the behavior of individuals, groups and the organization per se. This environment shapes the landscape "to ensure that organization culture, people's behavior and the work environment will be conducive to successfully establish and maintain Business Process Management as a Critical Core Capability of an organization."

2.7.1 Infrastructure

The more generic terms in the layman's world referring to "Infrastructure" are "Organization" and "Structure." It is therefore appropriate to define these two terms as an explanation to the term "Infrastructure". The word *organization* comes from the word organism, which is defined by the Oxford Advanced Learner's Dictionary (2003:824) as "a system consisting of parts that are dependent on each other." This definition emphasizes the two basic elements of an organization, namely parts and dependency. Within the Business Process Management environment, parts are defined as the activities (or processes) necessary to accomplish the work and the people assigned to these activities. Parts should relate to each other, as the complementary tasks of production and sales in a manufacturing organization.

Johnson (1993:18) states that "organizational structure provides order, enabling members to understand their roles, relationships, and responsibilities. It defines how the organization will operate, provides roles and relationship guidance so necessary for team work, and provides rules by which the game is played and a way to keep score. Such a framework provides the foundation for goals, functions and the allocation of assets."

Wheelen and Hunger (1986:A56) argue that "if the organization's structure is compatible with both present and potential strategies, it can be viewed as an internal corporate strength. If, however, the structure is not compatible with either present or potential strategies, it is a definite weakness and can act to constrain strategy formulation."

Beach (1975:161) defines an organization as "a system, having an established structure and conscious planning in which people work and deal with one another in a coordinated and cooperative manner for the accomplishment of recognized goals. The process of organizing involves dividing work and assigning it to individuals, groups, departments, etcetera. It includes the division of activities by level of authority and responsibility across the establishment into different kinds or types."

Hunt (1996:58) states that "the organizational structure that supports Business Process Management as a Critical Core Capability ranges from process-related organizational structures to informal Business Process Management forums to special process teams."

Devane (2004:127) is of the opinion that "although many models such as McKinsey's 7S model, Galbraith's Star model, and Six Sigma's Performance Framework have been designed to determine the structure of the organization, it is important to identify the key performance factors and their

interrelationships. Only then should an organization decide on a specific model that will enable the most effective and needs-driven organizational design."

Galbraith (1995:11-17) discusses organizations in detail and states that "the framework for organizational design is the foundation on which an organization bases its design choices." He denotes that "the framework consists of a series of design policies that are controllable by management and can influence employee behavior. The policies are the tools that management must become skilled in, in order to effectively shape the decisions and behaviors of their organizations." He explains that "the structure of the organization determines the influence of power and authority in the organization. In turn, this cascades into structure policies that can be divided into four areas: specialization, shape, distribution of power, and departmentalization." (See figure 2.4)

Within the definition that the author proposes, "specialization refers to the type and number of job specialities used in performing the work and shape refers to the number of people constituting the departments (span of control) at each level of the structure. Distribution of power, in its vertical dimension, refers to the classic issues of centralization or decentralization and in its lateral dimension it refers to the movement of power to the department dealing directly with the issues critical to its mission. Departmentalization is described as being the basis for forming departments at each level of the structure."

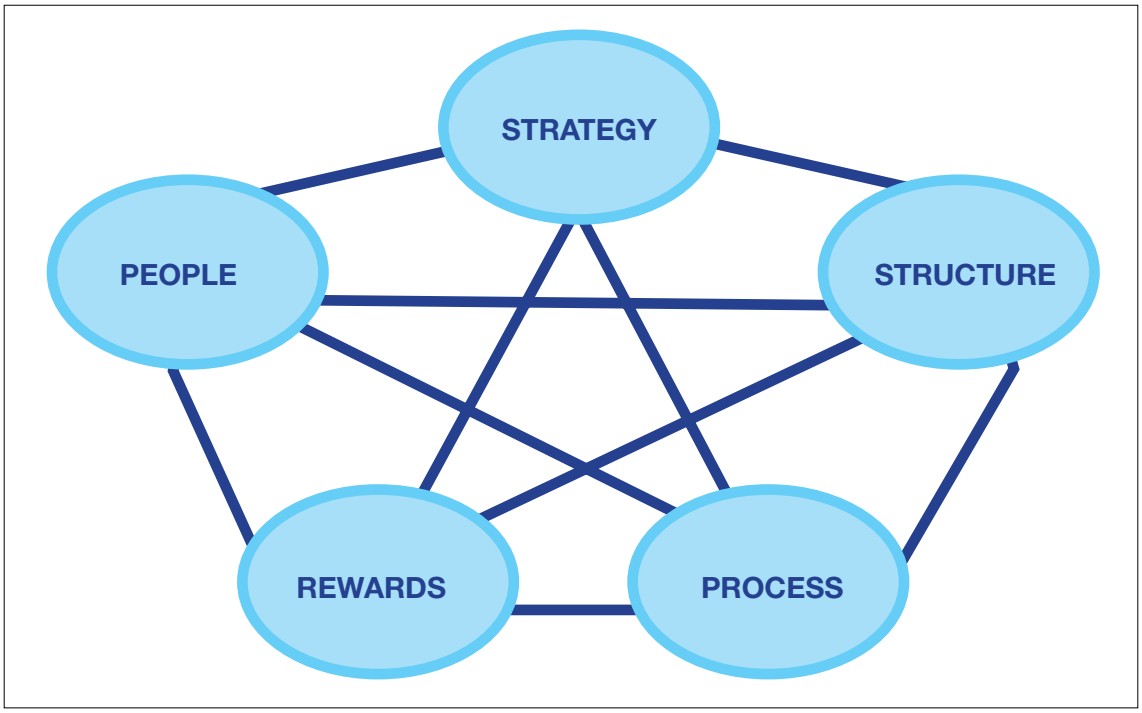

Figure 2.4 Star Model (Lawler, 1992)

Hunter (1995) points out that "organization theorists have long been aware of the productivity ramifications of organizational structures and innovations." He states that "some have asserted that if changes in business procedures and practices were patentable, their contributions to the economic growth of the nation would be as widely recognized as the influence of mechanical inventions." He notes that, "more recently, economists have come to realize that questions about the efficiency of

production, marketing, and finance are bound up with social questions about organizational structure and change, culture, and management style and practice."

He further states that, "within organizations, the strategy and size of the organization determines the choice of structures or designs. The standard dimensions on which departments are formed are functions, products, customer segments, markets, and geography. The structures can include centralized and decentralized functionalities - where centralized responsibilities usually will also encompass policy formulation and control over decentralized areas."

Pellissier (2001:87) summarizes the importance of different organizational structures for achieving success when she states that "organizations will have to become multidimensional, in that several organizational structures will exist within a particular organization and that individuals will have to learn to work within different structures while the executive of the future will require a toolbox full of organizational structures."

Within the above definitions describing "organization" the common denominator is people (individuals or groups) and the way they are effected by the organization or infrastructure of the organization i.e. "people assigned to these activities", "enabling members", "team work", "in which people work and deal with one another", "individuals, groups, departments etcetera", "informal Business Process Management forums to special process teams", "employee behavior", "power and authority", "job specialities used in performing the work", "number of people constituting the departments (span of control)", "customer segments", and "individuals will have to learn to work within different structures".

According to Robbins (1998:478) structure can have significant effects on its members and managers need to address the following when they design this structure; work specialization, departmentalization, chain of command, span of control, centralization, decentralization and formalization."

Throughout the literature reviewed organizational structure "fit" (and therefore indirectly the different levels within the organization i.e. the individual, the group, and the organization) was rated one of the highest priorities that constitutes success to an organization and will therefore also feature as such within the BPMCAM.

2.7.1.1 Roles, Responsibilities, Competencies and Skills

If the structure of an organization is the framework then the specific roles, responsibilities, competencies and skills are the flesh that gives life to the structure. Throughout the literature it was evident that authors are constantly aware of the complexity of the different roles that individuals perform as well as the importance of the "fit" of people in terms of their roles and responsibilities to optimize any functionality.

According to Johnson (1993:18) "individual roles provide behavioral guidelines and as the vision and mission change the roles should change accordingly. Furthermore, roles are an indication of both reporting and relationship lines and therefore impact individual and organizational behavior."

Beach (1975:211) states that "the detail of roles and responsibilities are embedded within job

descriptions and job specifications. Job descriptions further contain the objective facts that explain what the job is, what the specific duties and responsibilities are, what general conditions and situational factors are involved, and where the job will be performed. Job specifications contain information such as qualifications, experience, skills, etcetera required for the specific position."

As discussed in this document, the entirety of Business Process Management reaches far wider than just the improvement of single business processes. It is therefore an impossible task for one individual to actively manage all the tasks and activities related to Business Process Management or ownership within an organization or even within a given business unit. Role assignment within the Business Process Management domain therefore involves managerial and technical roles, such as process owners, process analysts, process custodians etcetera.

The establishment of positions, both centralized and decentralized, and the allocation of tasks are therefore no different from any other functionality and must be based on the accepted principles and standards as practised in the organization related to organizational design, e.g. dedicated ownership, manageable portfolio size, correct level of operation, proper reporting lines and span of control. With the Business Process Management functionality, factors such as organization size and number of processes in different areas should also be taken into consideration.

2.7.1.2 Management/Leadership

With reference to the earlier discussions on the generic management functions it is important to also understand the role that managers should play as leaders within the Business Process Management organizational structure. Leadership is defined by the South African Excellence Foundation (1998:14) as "How the behavior and actions of the executive team and all other leaders inspire, support and promote a culture of business excellence".

To Harrington (1987:37), "the most important requirement to make the improvement process part of your management system is to have your full management team participating in the process. This must however take place long before the operational employees become involved in the process."

According to Hunt (1996:55), "significant change or sustained Business Process Management efforts will fail if the management team of the organization does not actively lead and support the effort. The Business Process Management functionality must be the responsibility of a manager on executive level in the organization that is accountable for the function."

Al-Mashari and Zairi (1999) summarize the leadership role clearly when they state that "leadership has to be effective and strong, visible and creative in thinking and understanding in order to provide a clear vision of the future."

Hammer and Champy (1993:103) state that "the reengineering leader makes engineering happen. He or she is a senior executive with enough clout to cause an organization to turn itself upside down and to persuade people to accept the radical disruption that reengineering brings about. Executives are not assigned to "play the role" as it is a self-nominated and self-appointed role. The leader's primary role is to act as visionary and motivator."

Pinto and Kharbanda (1996:45-55) point out that "top management support for large organizations with corporate staff organizations has another dimension. If the top management in the "line" organization and "staff" organization do not partner and become equal stakeholders in the change, and you only have staff management support, you most likely are ill-prepared for a successful reengineering project. Line management in this context are the top managers of the operation ultimately accountable for business performance. Projects that result in major change in an organization rarely succeed without top management support in the line organization."

The above authors further state that "management support is extremely important to the success of any new project. Project managers not only depend on top management for direction and authority in running the project but they also rely on them as a safety valve. That is, when the project is undergoing difficulties, it is vital that top management are aware of the problems and are willing to offer additional resources. A project where top management is not supportive is deemed to fail."

The Information Systems Audit and Control Foundation (2000:8) clearly identifies management's great responsibility towards the success of an organization when they define Critical Success Factors as "the most important issues or actions for management to achieve control over within its business process control processes." They further emphasize "the level that Critical Success Factors must be pitched and that management-oriented implementation guidelines need to be established to identify strategic, technical, organizational or procedural actions."

According to Robbins (1998:387) "there can be little question that the success of an organization, or any group within an organization, depends largely on the quality of its leadership. Whether in business, government, education, medicine or religion, the quality of an organization's leadership determines the quality of the organization itself." Except for the basic tasks, management has definite and specific process management roles to play within the organization as well as within the change and improvement initiatives in the organization. The following roles are identified:

- Interpersonal roles: Managers are responsible for managing relationships with organizational members;
- Informational roles: Managers are responsible for gathering information and disseminating information to the stakeholders (upwards) and workers (downwards); and
- Decisional roles: Managers are responsible for activities such as processing information and reaching conclusions to achieve goals."

Leadership as identified within all the different roles and responsibilities within the Business Process Management function will feature as a major cornerstone in the proposed BPMCAM.

2.7.1.3 Steering Committees

Hammer and Champy (1993:114) state that "the steering committee is an optional aspect of the reengineering governance structure. Some organizations swear by them and others do without them. The steering committee is a collection of senior managers, including the process owner who plans the specific reengineering strategy. This committee decides on the project priorities and take final decisions on the general project direction."

Khade (2003) clearly indicates that "the leadership forums of executive committees of the business enterprise and Business Process Management steering groups are another important component of senior management leadership and demonstration of their ownership of the functionality. These leadership forums have the following responsibilities:

- Demonstrate visible ownership and commitment to Business Process Management;
- Identify and prioritize key business-wide processes;
- Establish performance improvement goals and performance measures;
- Provide process sponsorship and resource support;
- Provide guidance and support regarding enterprise-wide improvement projects;
- Provide a channel for strategic change issues; and
- Mediate any unresolved high-level Business Process Management issues."

2.7.1.4 Process Ownership

Because most organizations have a departmental view of activities, end-to-end processes are not clearly defined or effectively managed. For example, organizations tend to measure resource utilization and performance by department; they typically have very little information about overall process performance. Accountability for process performance is usually diffused throughout the organization.

Ostroff (1999:185-190) points out that "as organizations become more "process aware", they recognize that their functional organizational structure is an impediment to effective Business Process Management. Too much effort is spent on coordination, often through team meetings, memos, and complex computer systems. Too much time is wasted on hand-offs and quality problems between departments."

"The first step to overcoming this impediment is to assign accountability for process performance to a single process owner who can be held responsible for process outcomes. By simply assigning a process owner, success is not guaranteed. The process owner must have authority to manage the activities that make up the process."

Reitsma (1999) indicates that "there are two general approaches for empowering process owners. One approach is to create cross-functional Business Process Management teams that include representatives from each workgroup involved in a process. The second approach is to rebuild the organizational structure around processes. In the long-term, organizations are most effective when end-to-end responsibilities for core processes reside within a single department or workgroup."

The Centre for Strategic Leadership Studies (1996:2) argues that "although everyone involved in a process has a stake in the process, only one individual is ultimately responsible and accountable for the proper working of the process and is called a "Process Owner". A process owner usually is the supervisor or manager who has control over the entire process from beginning to end."

They further confirm that "although the title "Process Owner" was mentioned, not everyone is sure where this function fits into the organizational structure. In fact, different organizations have different solutions to the management of enterprise-level processes."

Hammer and Champy (1993:108) clearly state that "the process owner, who is responsible for reengineering a specific process, should be a senior level manager, usually with line responsibility, who carries prestige, credibility, and clout within the organization. The owner's job is not to do reengineering, but to oversee its execution."

Gabriel (1987:164) explicitly states that "process owners must have complete responsibility; he/she must control, improve and optimize the process to meet customer demand, and business needs (cost, cycle time, waste elimination and value creation)."

According to Hunt (1996:56-57) "process ownership must be formally assigned by top management, accepted by the owner (usually a senior manager) and included in the owner's Critical Performance Areas to enable management to measure the owner against the performance of his/her processes."

He further states that "the process owner must be a designated person, within the business process structure, who has authority to manage the process and is responsible for the overall output performance of the process. Process owners must have credibility within the business, are in charge of or closely associated with the processes and sub-processes assigned to him, have a strong grounding in management techniques, are willing to devote extensive amounts of time to Business Process Management and improvement actions, and must have excellent communication skills. The process owner usually has the following responsibilities:

- Help to determine the critical strategic processes for improvement/reengineering;
- Select and support the process improvement teams;
- Provide specific charter and accountability for teams;
- Oversee and support process teams implementation efforts;
- Final inputs to "To-Be" process improvement changes; and
- Ensure that cross-functional, cross-boundary relationships and integration issues are resolved."

Smith and Fingar (2003:247) point out that "Business Process Management offers a clean approach to the division of responsibilities between business and IT in the management of the process-centric enterprise infrastructure. The "process neutral" Business Process Management system is entrusted to IT to manage either in-house or outsourced. The processes running on the Business Process Management system belong to the corporation by line management, groups and other entities, depending on how the processes are segmented and designed. The corporate office or a designated senior official called a process owner owns high-level end-to-end processes." They indicate that the business side will mainly focus on:

- "Process discovery;
- Design;
- Optimization; and
- Analysis."

"Process Owners will share responsibility for deployment, execution and operations with IT."

2.7.1.5 Process Custodianship or Administratorship

According to Van Wyk (2005), "in large organizations the process owner can be supported by a "process custodian or administrator" that controls changes or enhancements to processes. It is very

important that the process owner and process custodian stay informed of all actions and decisions impacting on the process. Proper change management procedures must be instituted, monitored and controlled by the custodian/administrator."

The author further points out that "the positions of process custodians and administrators will pitch on a junior or middle management level. These individuals must be formally appointed and the responsibilities should become part of their Key Performance Areas and job descriptions."

2.7.1.6 Business Process Analysts, Process Engineers

Van Wyk (2005), on a more operational level, points out that "the process analysis and process engineering positions are positions held by trained staff that focus on the optimization of business processes on a full-time basis and that execute the different process improvement methodologies. These positions can operate from a centralized or decentralized position depending on the methodology of improvement exercised by the organization, i.e. continuous improvement or redesign of the processes under their control. The naming convention of these positions can vary from industry to industry, and organization to organization, but the core capabilities and responsibilities within these different names are very similar."

The Consulting Firm AT Kearney (2006) refers to "the business analyst's main tasks as the developing of models, performing of complex analysis and working on research assignments at both the offices of a firm and client sites."

Another BPR Consultancy Firm, Icon Process (2006) states that "the Business Process Analyst is responsible for assessing and describing operational aspects of businesses. This includes business processes, organizational culture and structure, facilities, and other resources."

The Info-tech Research Group (2006) defines "the Business Process Analyst's role as the devising and designing of business process requirements for all technology, business, financial, and operations-related business and systems critical to core organizational functions. This includes researching and analyzing data in support of business functions, process knowledge, and systems requirements." They are further of the opinion that "a Business Process Analyst is also responsible for proactively generating and compiling reports based on his or her findings, complete with recommended improvements to or new requirements for business processes and operational procedures. This individual, according to their view, will apply proven communication and analytical and problem-solving skills to help maximize the benefit of IT system investments to business. The emphasis in the role is to understand the requirements from the business perspective and translate them into a format that can be understood by and acted upon by a service provider."

They further state that "a Business Process Analyst is a common title for the person responsible for analyzing the business needs of their clients and stakeholders to help identify business problems and propose appropriate solutions. Within the systems development life cycle domain, the Business Process Analyst typically performs a liaison function between the business side of an enterprise and the IT Department or external service providers. Common alternate titles are Business Systems Analyst, Systems Analyst, and Functional Analyst, although some organizations may differentiate between the above titles and corresponding responsibilities."

2.7.1.7 Project Teams

Highly skilled teams, operating within well-designed and innovative team frameworks in various formats, are rated second to leadership as the most important work force grouping to ensure the success of an intervention. It is quite clear from the literature that teams span the organization and that these cross-functional structures have become the heart of the living and growing organization today.

Khade (2003) states that "cross-functional teams, made up of broadly trained and educated individuals that are representative of all the departments involved, as well as the capabilities needed for the improvement project, will provide the diversity of knowledge and proper buy-in needed to make innovative improvements that will be accepted in the organization." He is further of the opinion that "if this policy to utilize cross-functional teams is followed, the team will be able to shorten the learning curve for the organization."

According to Hunt (1996:119-133), "in order to determine whether each process and sub-process is appropriately structured, an organization should create a cross-functional team to build their process maps that show input-output relationships among process-dependent operations and departments in a step-by-step sequence of activities."

Ostroff (1999:13-18) is of the opinion that "teams need to be formed that reflect existing ownership responsibilities and the way the work is actually performed within the organization." He further argues that "contrary to the way management structures appear on hierarchical organization charts, work is actually accomplished through processes that flow horizontally, across the organization." He states that "the bi-directional vertical flow on the current organizational charts only reflects how control is exerted from the top to the bottom, an effective structure for communication top-down."

Rummler and Brache (1991:55-70) suggest that "in a Business Process Management environment where total quality is practised, teams are created to represent the top, middle, and operational levels of an organization." They further denote that "the highest-level team is called an Executive Steering Committee, teams of mid-level leaders are called Quality Management Boards and teams of individuals who work in a process are called Process Action Teams." They concluded that, "although all three levels of teams are expected to share a common approach to improvement within the process cycle, they have different roles and responsibilities."

Wilson (2002:22-24) made the assumption that, "in the 1990's BPR became the hot new topic, offering drastic improvement, by redesigning the whole business organization around automation." According to him, "the tree-like structure for organizing a business no longer looked appropriate and organizational theorists were scrambling to suggest new ways of organizing in teams and teams in teams, instead of departments."

Hammer and Champy (1993:109-114) declare that "cross-functional teams should work together to model and analyze processes ("As-Is" condition), and design a "To-Be" condition that maximizes process operations within the context of the established organizational and technological infrastructure. There is a strong reliance on capturing the experience base of project participants through brainstorming and other groupware techniques as the basis for generating improvement

ideas. While these techniques often produce significant improvement ideas, the ideas are limited because of the insider perspective of members of the improvement team."

According to the research performed by Al-Mashari and Zairi (1999), "teams should be made up of people from both inside and outside the organization." They further are of the opinion that the criteria of an effective BPR effort should include the following team-related attributes:

- "Competency of team members;
- The credibility of the members and team within the organization;
- The creativity of team members;
- The empowerment of the team;
- The motivational level of the team and individuals;
- Effective team leadership;
- The training of members in process mapping and brainstorming techniques;
- Proper organization of the team;
- Complementary skills among team members;
- Adequate size of the team;
- Interchangeable accountability;
- Clarity of work approach; and
- Specificity of goals."

Although the role and value of teams can never be overemphasized in day-to-day process execution, business process improvement or business process management environments management must constantly manage the behavioral aspects of groups and the individuals that make up the groups. Robbins (1998:467) states that "individual competitiveness within teams as well as team competitiveness must be identified and harnessed for the good of the organization. Competitiveness not directed towards positive results are from an economic, interpersonal and cooperation viewpoint harmful to the organization because these teams remain a group of individuals that never achieves harmony or total efficiency."

2.7.1.8 External Consultants

Hammer and Champy (1993:109-114) acknowledge the knowledge that external consultants can bring into an organization when they state that "the actual work of reengineering – the heavy lifting – is the job of the reengineering team members. To function as a team they should be small – between five and ten people. Each team will have two kinds of people, insiders (people who work within the process to be reengineered) and outsiders (people outside the process or even outside the organization). Organizations that don't have appropriate internal outsiders (organization employees outside of the area being reengineered) can go outside to find them, typically by engaging consulting firms with track records in reengineering. The consultants bring with them experience that organizations may not be able to produce on their own."

Robertson (2005) emphasizes that "the use of external consultants is an effective investment providing the organization is using them to answer new questions." He states that "if the organization is continually using external help to solve the same problems it is a sign that the organization is not learning and that they need to develop some mechanism for tapping and transferring knowledge." Consultancy to him is a product, and like any other product it can be made visible, tangible and

transferable. “In order to take full advantage of external consultancy, an organization needs a procedure for capturing and communicating experience.”

With the rapid change in the external environment no organization can, with only their own internal workforce, keep abreast of all the changes. It is necessary to invest in knowledge from outside. It is however also necessary to manage the external consultant the way other valuable resources are managed in order to ensure that the organization derives maximum value from that asset.

Although the utilization of “outsiders” has definite positive value and more specifically with regards to the influx of new and diverse ideas and knowledge management must be wary of the possible negative views and attitudes of individuals and groups perceiving the utilization of “outsiders” as disregard of internal talent and knowledge. Cummings and Worley, (2005:74) warns against the “non-inclusion of internal members during the entering and contracting process of an external practitioner as they may withhold their support for commitment to the process later.”

2.7.1.9 Stakeholders

“My belief is that those who are affected by decisions should be involved in the process. Everyone can make a contribution to the problem-solving process...and their experiences would help in producing a strategy for success.”

– Richard Prebble, Minister for State-Owned Enterprises NZ Government

Boutelle (2004) comprehensively discusses the stakeholder within the business processes of the organization. He defines stakeholders as “all those individuals, either external or internal, or organizations that stand to gain or lose from the success or failure of a system.”

He states that “within process improvement endeavors, the stakeholders should be identified and characterized to ensure that the stakeholders of the process under improvement include customers, suppliers, higher authority, and resource providers. The relationship of the stakeholders to the process should be determined in terms of quantifiable measures.” To complete the above task, he proposes that “the improvement team conduct an investigation of stakeholder needs, requirements, interests, and desires as they relate to the vision of the improved process.” He acknowledges that “while the customer stakeholder needs to be the focus of these efforts, successful process improvement projects will require the support of the other process stakeholders as well.” He states that “their support will be obtained more readily if these stakeholders are included in the performance gap analysis step.”

The above author further points out that “if a stakeholder provides an input to the process, feedback measures will tell the stakeholder how the input was used and if the stakeholder receives an output from a process, feedback measures indicate how the stakeholder used the output. Because of the expectation on the part of the stakeholder who provides a process input, the process improvement team must know what that expectation is, and whether there is a gap between expectation and actual process performance. The same holds true if the stakeholder receives an output from the process. Measures are the means to determine the existence and extent of the gap. The process improvement team must understand any performance gap in terms of the value chain from supplier to customer and the control chain from higher authority to resource provider.”

"Verification by stakeholders is exceedingly important before process improvement continues to ensure that the process improvement team does not lose sight of why they are improving the process, which is usually to better service stakeholder interests."

From the internal view of the current state it is necessary to focus everyone externally on the reason the business process exists, i.e. to satisfy the business need of the various stakeholders, customers (internal and external), shareholders, staff and suppliers. This provides the touchstone against which any changes can be measured to ensure they maintain integrity with regard to the stakeholders' requirements.

The Centre of Strategic Leadership Studies (1996:7) points out that "an organization can and should work with Customers and Suppliers as stakeholders and as part of the extended system to improve quality. Customers can provide information that helps an organization to focus its improvement efforts on those product and service characteristics that have the greatest impact on quality. Suppliers provide products or services that affect an organization's ability to perform its mission. Working with suppliers to clarify current needs or to share process improvements could reduce problems and avoid defects due to faulty materials or inadequate service."

There is no doubt amongst organizations today that stakeholders play a major role within the organization's value chain. The moment that an organization interacts with any group at any level, it becomes a stakeholder and could have a positive or negative impact on an organization. Stakeholder management should therefore become a serious responsibility of the organization as well as the project or team implementing the change.

2.7.1.10 Roles and Responsibilities specific to Business Process Management

According to Van Wyk (2005) "specific roles and responsibilities within the Business Process Management environment can be performed on either a centralized or decentralized level." These roles and responsibilities are listed below.

They propose that the centralized area can perform the following functionalities and responsibilities:

- "Obtaining and maintaining top management buy-in and support;
- Feedback to top management on enterprise-wide business process performance and maintenance;
- Implement and maintain business process owner and business process custodian enterprise-wide forums;
- Compiling and maintaining of policy, strategy and structure regarding enterprise-wide Business Process Management issues;
- Determining of standards, performance measurements and performance controls on all Business Process Management facets;
- Training and up-skilling of centralized and decentralized resources;
- Assistance to decentralized areas regarding more sophisticated interventions e.g. BPR, simulations, facilitation of business process issues between role-players;
- Process ownership and custodianship of all shared system business processes;
- Custodianship of enterprise-wide final signed off and implemented business processes in respect of:

- Quality control of process mapping standards;
- Ensuring that all stakeholders have indeed accepted, signed off and implemented the approved process;
- The publishing of the process maps;
- The control and population of the enterprise-wide process taxonomy; and
- The control of the change management process enterprise-wide."

The decentralized area can perform the following functionalities and responsibilities:

- "Facilitate, design and document the "As-Is" business processes in order to obtain a view of the current operational environment;
- Define and document business processes throughout the life cycle of the product or service in the required standard;
- Provide process designs and other inputs with regard to the required documentation;
- Produce an end-to-end business process design;
- Ensure that process and systems are integrated into a single business solution;
- Perform business system impact analysis on any changes that are imposed on the current operational environment;
- Define process performance criteria in terms of time, cost and resources;
- Facilitate, design and compile relevant process-based Service Level Agreements between role-players;
- Participate in conducting User Acceptance Testing and Business Acceptance Assessments of the new systems and changes to existing systems to ensure business requirements have been met;
- Identify impact of process changes on job descriptions of staff that execute work within the process;
- Execute requests for business process changes for small enhancements according to the rules of engagement;
- Conduct business process improvement initiatives that are aimed at improving efficiency and effectiveness of operations;
- Develop, maintain and enhance related manuals and procedures within the domain of responsibility;
- Produce related circulars to ensure effective communication of process and procedural changes within the business environment;
- Ensure content alignment between processes, manuals, procedures and training material;
- Provide first-line support to business units and support areas with problem resolution;
- Identify the scope (core and sub-processes) and life cycle of business processes within area of responsibility;
- Facilitate and integrate process designs, improvements and maintenance amongst role-players;
- Interact and network with other business units' custodians in order to ensure alignment and integration of operations;
- Measure processes against performance criteria;
- Act as the single point of entry for change control for process manuals and procedures on a defined product or service;
- Standardize process elements/components across business units where it makes business sense;

- Ensure that impacts of improvement initiatives are pro-actively identified and incorporated into designs;
- Ensure alignment of business processes in support of business units' structures and products;
- Provide specialized product and associated input during improvement initiative work sessions;
- Provide subject matter expertise on a specific product or service that is allocated to this role;
- Report according to predefined measurement criteria on processes under own control; and
- Perform the process management function in terms of:
  - Quality review of models;
  - Stakeholder acceptance and sign-off; and
  - Publishing of "As-Is" models."

2.7.1.11 Policies, Procedures and Rules

Organizations are constantly at financial, operational or reputational risk. In order to minimize risk and comply with regulatory requirements, organizations must contain measurements within policies, procedures and rules.

According to Johnson (1993:28-30), "rules, policies and procedures serve as guidelines to prevent the continual need for supervisory instruction and control. Policies provide boundaries within which individuals can use some discretion to accomplish the day's work. Procedures are standards that guide work performance to ensure processes are completed the same way each time, and rules are statements that tell an individual exactly what they should and should not do." He is further of the opinion that "when rules, policies and procedures do not keep up with process evolution, people develop their own system to complete the work at hand. The result of this is that people get trained on "how it should work" and then merely return to "how it has always been done round here"."

Beach (1975:67-71) views a policy as "a plan of action and should be in writing. It is further a statement of intent, committing management to a general course of action. It requires that management give deep thought to the basic needs of the organization, business units and individuals. It also assures consistent treatment of the objective of the policy and it serves as a standard of performance."

According to Campbell (1998:54-55) "policies, procedures and rules are required by organizations of all types to operate efficiently, avoid employee confusion, and adhere to legal and regulatory requirements. He defines policies as guidelines regulating organizational action and controlling the conduct of people and procedures as prescribing the normal operating method of the organization that provides the protocol for implementation or the "how to"."

The same author further states that "policies, procedures and rules are about clear communication; it's making sure that people have the information they need to do what they're supposed to be doing. With sufficient information, both the organization as a whole and the employee will function properly." He is further of the opinion that "the compilation of policies, procedures and rules is not an ad-hoc occurrence but a planned intervention that includes steps such as analysis, research and prewriting to ensure accurate and well-articulated documents."

He emphasizes the importance of selecting "a primary format (e.g. narrative, outline, play script, or flowchart) that best suits the intended audience." It is further important to him that "an organization

will ensure that policies, procedures and rules are in line with design and production elements for creating good manuals and handbooks."

He further states the fact that "the importance of notifying employees in person, in writing, or by e-mail to avoid non-compliance with a policy, procedure or rule must be stressed." To him "the review process, including verification, validation, editing, and proofreading must be scheduled and driven by the responsible parties, and staff from all levels and areas of responsibilities must be included."

2.7.1.12 Management of People

The management of people has moved through various stages over the past decades - ranging from autocracy to empowerment. But never has the importance of people in an organization's drive for efficiency and excellence been emphasized more than in the literature on performance enablers and excellence models.

Within the comprehensive analysis of the most prominent excellence models Porter and Tanner (2004:43-57) state that "the management of people, including Human Resources strategy, competencies, training, conditions, benefits, recognition, and awards, is the fulcrum of achieving excellence in business and results." They further state that "the Baldrige criteria emphasize the need for good Human Resources practices and employee involvement in order for an organization to make substantial progress in its quest for quality. Human Resources Management is clearly an important participant in an organization's quality management process, as it determines the effectiveness of an organization's process and product management and customer focus and relationship management efforts. Human Resources Management has a significant and also indirect cultural and behavioral impact on the organization's performance as well as on improving the organization's quality focus in general."

Beach (1975:219) claims that "the management of people governs the policies of recruiting, selecting, rotation, training, development, job definition, performance standards, appraisal, and remuneration."

Devane (2004:34-35) takes a more holistic view of the importance of people during any new initiative by introducing the following people elements as extremely important for management to concentrate on:

- "Formal reporting relationships: People need to know team boundaries and what is expected of them by whom;
- The social elements of work: The sharing of work- and non-work-related stories;
- Connection to existing values and organizational norms: Ensure people are familiar with the norms and values;
- Connection to existing patterns of interaction: Old unproductive habits must be identified and managed out on both management and operational level;
- Actions and new norms that negate undesirable aspects of the current culture: Leaders must strive to actively manage culture and prevent backsliding to old practices;
- The nature of supervision: The change of old management style to the newly empowered team concept;
- Feelings of competency and achievement: Leaders must structure conditions in which people can demonstrate competence and achieve in the new environment;
- Local goal-setting and decision-making authority over local work-related issues: Leaders must

continue to grant authority to front-line workers after the redesign so that worker commitment levels continue to rise;
- Continual development of employee skills: The organization must be built on the foundation of the organization developing internal capabilities, including new capabilities for technical performance, process improvement, interpersonal skills, managerial skills, and problem solving; and
- Conditions and structures exist for productive work criteria: Conditions such as autonomy in local decision making; continual learning (goal setting and feedback); variety of content, rhythm, and pace of work; mutual support and respect; meaningfulness in doing something with social value and seeing the whole process; and a desirable future."

2.7.1.12.1 Training of Staff Complement

The value and necessity of competent and knowledgeable staff as well as the role that "training" must play in an organization's endeavors to move from being just competitive to being the market leader are continuously emphasized. Competitive advantage is associated with the speed at which an organization's workforce can change and adapt and how short the learning curve can be. From the literature it was further evident that organizations are responsible for technical training related to the Critical Core Capabilities of the organization. People do not dispose over the "corporate technical skills or the way we do it around here" type of knowledge at inception of their careers. It is pivotal that this type of knowledge is incorporated into the development plan of employees to ensure optimum productivity and efficiency.

Beach (1975:372) defines training as "the organized procedure by which people learn knowledge and/or skills for a predefined purpose, such as new skills, technical knowledge and problem solving techniques. A myriad of benefits can be derived from an effective and well monitored training program, both to the organization as a whole and the individual." These include:
- "Reduced learning time to reach an acceptable standard;
- Improvement of performance on present job;
- Attitude formation;
- Aid in solving operational problems; and
- Fill manpower need."

The above author further states that "the training methodology chosen for a specific training program or unit is determined by the availability of cost and time, the number of employees to be trained, the depth of knowledge required and the training background of the employees involved, such as prior learning and experience."

Khade (2003) claims that "learning is strategically important as it contributes directly to the attainment of organizational objectives and is to the organization's benefit as much as to the benefit of the people concerned. As such, human capital is an investment. That in turn implies that the human capital supporting the organization's Critical Core Capabilities should be established and built as a priority." He is further of the opinion that "organizations could increase their competitive advantage through building and leveraging human capital and the development of staff, especially those involved in managing the business processes."

He further points out that "to maximize the impact of training and development on the Business

Process Management staff's performance, it is essential that training not be seen as something that occurs only in classrooms, at scheduled intervals, or as the sole responsibility of the training provider. Training solutions must be designed and delivered in a manner that empowers the managers of the different business units to sustain learning in the business process operations environment, supported and enabled by the practice of coaching."

Kelly (1995:59-72) points out that "technical training may solve employees' performance problems or take advantage of opportunities caused primarily by technical competency gaps. It identifies, develops, and reinforces the technical competencies which employees require to perform current or future jobs optimally. For training to be optimized it is important to establish what core competencies do employees already possess and what core competencies they would need to develop."

The above mentioned author also notes that "the way in which the technical training function fits into the larger organization depends on several factors, such as the organization's philosophy on centralization and decentralization, the size and nature of the organization, technology required to provide the training, financial resources and track record of training departments." He found that "in most organizations, the structure of the technical training department is a combination of centralized and decentralized internal functions and externally aligned with training institutions such as colleges, universities or other training vendors."

He further emphasizes that "if an organization is serious about sustaining their training function, a technical training policy must be developed and closely monitored within all business units of the organization. The organization must establish and legitimise the accountabilities and roles in facilitating, implementing, and coordinating the technical training system and activities. The technical training system must be derived from and focused on supporting the strategic and operational intent of the organization as a whole and should be aligned with the overall Human Resources Strategy. The policy must be supported by procedures and standards to ensure that all role-players are certain of their roles and responsibilities in such a training program. Such roles and responsibilities should be defined, communicated and engagement from all relevant role-players should be ensured." He is of the opinion that "the identification of the need for the development of technical training programs resides with both executive management and line management. The responsibility for the design and development resides with the Human Resources or the Training Department, in collaboration with the management team of the specific business unit. A prerequisite to the management of technical training programs is the understanding by technical training designers that there is a significant difference between adult and young learners and the training approach should be adapted accordingly."

Leavitt (2003) is of the opinion that the term Knowledge Management "is loosely used to describe any number of activities related to collecting all the knowledge of an organization and creating processes or systems to make it accessible to everyone within the organization." He argues that "in order to manage knowledge, organizations must first ask the following questions: "How is work done here?" and "what do our people need to know?" He points out that these questions, of course, lead back to the consideration of the organization's business processes (inputs and outputs).

2.7.1.12.2 Measurement/Appraisal of Staff Complement

Measurement has become a key activity within organizations. Numerous measurement systems

have been designed to measure both the organization as well as its staff, measurements such as 360 degree assessments and the Balanced Scorecard. Measurement of staff to determine the actual level of competency in relation to the desired state has become an annual or even quarterly activity in most organizations. Although measurement serves as a basis for incentives as well as a management tool within organizations today, not all authors perceive measurement of the individual as a positive intervention.

Beach (1975:313-314) defines performance measurement or appraisal as "the systematic evaluation of the individual with respect to his performance on the job and his potential for development." The purpose of appraisal systems, according to him, is:

- "Employee performance: Appraisals assist to create and maintain a satisfactory level of performance by employees in their current job;
- Employee development: Highlights needs and opportunities for growth and development via self-development, formal courses and job activities;
- Supervisory understanding: Formal and periodic appraisal encourage supervisors to observe and understand incumbents' behavior;
- Guide to job change: Appraisals aid decision making for promotions, transfers, lay-offs, job termination, etcetera;
- Wage and salary changes: Size and frequency of pay rises can be linked to performance appraisals; and
- Validate personnel program: Compare and correlate performance ratings against selection criteria to establish if the criteria assisted in determining the right candidate for the job."

In summary he declares that, "in order to evaluate employees, it is necessary to establish a reasonable benchmark. There must be written standards of accomplishments employees can expect to meet and these standards and measures must be related to the job and job specifications."

Al-Mashari and Zairi (1999) are of the opinion that, as BPR could result in major structural changes in the form of new jobs and responsibilities, "the formulation of clear job descriptions and responsibilities are prerequisites for successful implementation."

According to Wilson (1995:16), Deming was strongly against appraisals for the following reasons:

- "The performance appraisal process usually concentrates on the individual's performance, while work is always a function of the system and processes in the organization;
- Most of the group's results are accomplished by its collective actions, yet the appraisal usually focuses on individual performance independent of group performance considerations; and
- Appraisals tend to examine performance over a relatively long period of time, a year in most cases, assuming that performance is consistent and within the control of the performer. However, systems, processes, and environmental forces are in constant motion (day-to-day) and are often beyond the individual's awareness or control."

2.7.1.12.3 Rewarding and remunerating Staff Complement

Evaluation and reward systems should be closely linked, as the output of the one is the input to the other. It is extremely important that staff on all levels within the organization perceive these systems as transparent and fair.

Galbraith (1995:14) is of the opinion that "the purpose of reward systems is to align the goals of the employee with that of the organization. It should enable motivation and provide incentives for the completion of a strategic direction." He states that "the reward system must be congruent with the structure and processes to influence the strategic direction." He furthermore argues that "reward systems will only be effective when they form a consistent and encompassing package in combination with other design choices."

Beach (1975:679) has conducted intensive research on wage incentives and has found that "the percentage of workers that are paid on an incentive basis has declined dramatically since the early 60's." He identified numerous reasons for this downward trend, including "the high administrative impact, automation and negative management perceptions." However, he maintained that "reward payments, under all circumstances, enable those employees that produce more than the quota, standard or norms to earn more." He is further of the opinion that "the payment of rewards, in general, must be linked to the specific task and that increased payments or incentives must be based on cooperation between employees and management."

Al-Mashari and Zairi (1999) strongly advise that "reward systems should be revised as part of the BPR effort and that the new reward and incentive system must be widespread, fair and must encourage harmony among employees."

2.7.1.13 Communication

Communication is perceived as one of the most important activities within an organization today. Within large organizations it is unfortunately also identified as one of the most problematic areas to maintain successfully. The communication media have expanded tremendously over the past years and today include telephone, fax, e-mail, cell phone, memos, internet, intranet, etcetera. The growth in communication media, in general, has had an extremely positive impact on the economic activities of an organization or even a country but unfortunately also poses certain complications as not all media are suitable for all types of messages or audiences.

Beach (1975:581) defines communication as "the transfer of information and understanding from person to person via systems of communication that include upward, downward and horizontal communication channels."

According to Sorenson, Kennedy and Ramirez (1997:1), "communication is the process of sending and receiving messages to create similar meaning between people. Effective communication occurs when speakers, senders, listeners and readers all agree about the content of the messages and understand the communication intent."

Al-Mashari, and Zairi (1999) discuss communication according to different authors' views and state that according to Talwar, 1993; Hinterhuber, 1995 (Al-Mashari, and Zairi 1999) "effective communication between stakeholders inside and outside the organization is necessary to market a BPR program. According to Berrington, 1995 (Al-Mashari, and Zairi 1999) it furthermore ensures patience and understanding of the structural and cultural changes needed for process reengineering. According to Cooper and Markus, 1995 (Al-Mashari, and Zairi 1999) it improves the organization's competitive positioning. According to Davenport, 1993; Janson, 1992 (Al-Mashari, and Zairi 1999)

communication should be open, honest, and clear, especially when discussing sensitive issues related to change such as staff reductions."

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2.7.1.14 Perceptiveness to Change

Al-Mashari and Zairi (1999) argue that "in order to leverage organizational change effectively on a one-to-one and one-to-many basis, effective interaction is required to enrol key influencers of both individuals and groups within and outside of the organization."

They further believe that "organizational culture influences the organization's ability to adapt to change and that the existing culture contains beliefs and values that are often no longer appropriate or useful in the reengineered environment. Therefore, the organization must understand and conform to the new values, management processes and the communication styles that are created by the newly redesigned processes so that a culture that is conducive to both change and sustained transformation could be established."

2.7.1.15 Critical Success Factors applying to Enterprise Architecture

Based on the evidence from the relevant literature and as discussed throughout the preceding paragraphs the following Critical Success Factors have been identified with relation to the areas included in the criteria infrastructure. These Critical Success Factors will form the basis of the BPMCAM.

Enterprise Architecture

- The Enterprise Architecture should guide the engineering of the organization's organizational operating model, business process models, information systems, and technology applications and infrastructures.

Organizational Structure

- The organizational structure must enable the management of business processes horizontally across business units;
- The organizational structure must clearly define roles and responsibilities, as well as the placement of power; and
- The Business Process Management organizational structure, for both centralized and decentralized units, should be aligned with the business functions so that it can adapt rapidly to changes in the business environment.

Financial Management

- Financial management regarding Business Process Management must be well-established and controlled on both a strategic and operational level.

Roles and Responsibilities

- Essential Business Process Management functions must be explicitly identified in the organizational model, with clearly specified roles and responsibilities;
- Every person that is responsible for a core process must be identified and formally assigned the responsibility as part of his/her critical performance areas; and
- The roles and responsibilities must be designed to empower the Business Process Management staff.

Management

- Senior management must display a hands-on responsibility and ownership of business process strategy, governance, enterprise architecture and process improvement through constant involvement, continuous communication of the strategic goals and decision making that is consistent with the process thinking practised;
- Management must endorse and have control over the Critical Success Factors of the Business Process Management functions;
- Staff and line management must be actively and personally involved in improvement activities; and
- Management must act as champions of change to overcome political and organizational barriers to change.

Steering Committees

- Steering committees must be formed and participate as active sponsors of all the major Business Process Management initiatives;
- Senior management must display their commitment and ownership through leadership roles within the steering committees; and
- Steering committees must have a final decision-making capability.

Process Ownership and Custodianship

- Process ownership and custodianship must be allocated, accepted and must constitute the individuals' main critical performance areas;
- Process owners and custodians must be regarded as role models with in-depth knowledge and must be respected within the organization as process owners; and
- Process owners and custodians must be full-time dedicated resources and must take ownership for end-to-end processes, not only for sub-processes or functional silos.

Analysts

- Analysts appointed must be competent and knowledgeable in process improvement;
- Analysts must be dedicated to process improvement and committed on a full-time basis; and
- Analysts must be respected for their recommendations throughout the organization.

Project Teams

- Cross-functional project teams must be formed and constantly utilized;
- Cross-functional project teams must have the relevant decision-making capability;
- Cross-functional project teams must be properly trained in process improvement techniques and must have capabilities to complement their subject matter expertise; and
- Interdepartmental teams must be formed to resolve problems.

External Consultants

- External consultants should be utilized in all sorts of projects and utilized to introduce new thoughts and to train internal staff; and
- The organization should have the ability to capture and communicate the intelligence that external consultants bring.

Stakeholders

- All business process stakeholders (internal and external) must be actively involved in business process improvement;
- Processes must be fully understood by all the stakeholders involved; and
- The organization's stakeholder expectations must be identified and respected by the organization within the improvement initiatives.

Policies, Procedures and Rules

- Well-defined and clearly articulated mission statements and policies must be shared with employees at all levels of the organization;
- Policy enforcement rules must be determined at the time of policy development;
- Procedures must accurately define how each process should be handled;
- Rules, procedures and standards must be updated continuously as improvements are achieved;
- A compliance process must be in place to measure awareness, understanding and compliance with policies;
- Business Process Management control policies must be aligned with the overall strategic plans;
- There must be practical guidance with respect to the implementation of policies and procedures; and
- Business Process Management control policies must be current and up-to-date.

People Management

- The organization's Business Process Management plan should include Human Resources Management as a component and must be in place and supported by Top Management;
- There must be consistency between the Business Process Management strategic plan and the Business Process Management Human Resources Management plan;
- Details of roles and responsibilities must be embedded in job descriptions, job specifications and critical performance areas;
- The required quality of staff (training, transfer of information, morale, etcetera) and availability of skills (recruit, retain) must exist;
- Succession plans must be in place to avoid expertise gaps; and
- The Business Process Management team must have direct input and control over selection, training, development, job definitions, performance standards, appraisal and remuneration, as well as decentralization or centralization of staff components.

Training

- A comprehensive education and training strategy supported by detailed training programs, focused on both individual and organizational needs, must be in place;
- Appropriate ongoing Business Process Management training and career development must be performed to fulfil the needs of the Business Process Management Human Resources Management plan;
- The education and training programs must be incorporated in the organization's budgetary planning and capacity management, and the appropriate training facilities and resources should be allocated;
- Training and education must be critical components of the employee career paths; and
- Together, employees and managers must identify and document training needs.

Measurement of staff

- The performance of business processes must be managed through process or value streams, rather than being linked with functional activities;
- Performance and current capabilities of people must be assessed and measured against agreed and contracted critical performance areas;
- Standards for the performance of every process must be determined at improvement stage; and
- The necessary controls must be in place at the point of accountability.

Communication

- There must be a person accountable for ensuring that all communication is comprehensive, informative, transparent and persistent;
- An inventory must be kept of all communication disseminated in the Business Process Management system; and
- A control process should be in place to ensure that all participants received, acknowledged and adhered to communication.

2.7.2 Process Architecture

Before discussing business processes we should know how processes originated. To do this, we must first acknowledge the basics of the organization. Organizations form a fundamental part of our society and our lives. An organization may be simply defined as a human grouping established to accomplish specific objectives and is expected to perform a mission or turn out products or services, and the members of that organization undertake to do the work involved. Several observable characteristics of an organization emerge, including:

- Division of work and specialization;
- Coordination of varied activities (processes);
- Communication; and
- Definition of relationships between activities, or people.

2.7.2.1 Process

The importance is that process seems to be the common denominator within all views on Business Process Management. Process and process attributes have been analyzed and defined to the finest detail in the available literature and will be discussed at the same level of detail in this Thesis.

Various definitions of a process exist within the literature. These definitions differ mainly according to the author's use of words, but in general constitute the same basic elements. It is important that the term "process" is fully understood in order to acknowledge the role that business processes play as a Critical Core Capability in the operational efficiency of the organization.

According to Hunt (1996:116-118), irrespective of type of process "the basic building blocks of a process are the input, control, output, and mechanism of the process:"

- "Input: Refers to anything that will be transformed by the activity or process and includes material and information;
- Control: Refers to those elements related to the activity that constrain or govern how the activity will be conducted, i.e. policy, budget constraints and customer requirements;

- Output: Refers to the result of the activity after it has been transformed by the activity; and
- Mechanism: Refers to those aspects that accomplish or support the activity, which could be people, systems, facilities or equipment necessary to accomplish the activity."

"Processes may further differ with regard to level and activities but, summarized in layman's terms by the same author, the following generic statements prove that processes all have the same underlying characteristics."
"A process is:

- The steps and decisions involved in the way work is accomplished;
- A process can be either an operational activity or a decisional activity and should be described using a verb;
- A series of related activities that take an input, add value to it, and produce an output for an external or internal customer;
- A sequence of repeatable, value-adding activities, characterized as having measurable inputs and outputs; and
- A description of how work gets done."

The Oxford Advanced Learner's Dictionary (2003:928) defines a process as "(1) *a series of things that is done to achieve a certain result,* (2) *a series of things that happen; especially ones that result in natural changes,* and (3) *a method of doing or making, especially one that is used in industry.*"

According to Pellissier (1999:1) "a process can be defined as "A set of pre-defined tasks or activities executed to achieve a pre-specified type or range of outcomes to satisfy a diverse set of stakeholders who have an interest in the process". According to the above author, processes consist of three activity types:

- "Value-adding activities (important to customers);
- Core activities (activities which flow across boundaries and which are primary functional, departmental or organizational); and
- Control activities, which are created to control core activities across boundaries."

According to Gabriel (1987:25), "a business process is the logical organization of people, materials, energy, equipment and information into work activities designed to produce a required end result - product or service."

In his discussions of an organization as a living structure, Galbraith (1995:14) notes that "if structure is thought of as the anatomy of the organization, processes are its physiology or functioning. Vertical processes allocate the scarce resources of funds and talent. Horizontal or lateral processes are designed around the work flow."

Conti (1993:40) interprets that "a process is defined as a transformation of a set of inputs, which can include actions, methods and operations, into outputs that more or less conform to expectations and satisfy customer needs." In this interpretation, "resources such as people, equipment and knowledge are regarded as inputs. The essential aspects of a process are, however, easier to grasp if resources are included in the process, so that input consists only of the streams coming from other processes in an organization or from sources outside the process."

Dillon (2004) points out that "the scope of a business process can be limited to a particular department in an enterprise, it may span multiple divisions within an enterprise or it may require inter-enterprise collaborations. In the case of a simplistic departmental process, the Business Process Management infrastructure will probably be a homogeneous specific Business Process Management system with local resources. In the general case, however, and especially in inter-enterprise processes, processes are executed in a federated Business Process Management infrastructure."

Dobbins (2002) points out that "within the technological domain, the focus on process is important because of the fact that the program management environment today is in constant flux, caused by rapid changes and advances in technology, changing technical or financial program requirements, corporate mergers, internationalization of many programs, use of integrated product teams, moving to capabilities-based acquisitions, and a focus on systems of systems." To him, "process allows the organization to respond to a rapidly changing environment while tools are generally not that flexible."

Reitsma (1999) states that "the work of any organization consists of business processes and that, simply stated, these are sets of related activities that combine to complete a unit of work. Each process has a customer, either internal or external."

He further observes that "in many organizations, business processes are not very visible to management. Instead of management understanding and supporting the goals of an entire process, departmental managers often focus on the small pieces of the process that fall within their department. But, it is process performance, not departmental performance that determines an organization's effectiveness and success." He emphasizes the fact that it is a matter of "the whole being greater than the sum of its parts". "To be efficient and effective, organizations must manage overall business processes, not just the separate parts."

To facilitate a shared meaning, the comprehensive definition of business process by Hunt (1996:3) will be used. "A business process is a series of steps designed to produce a product or a service. Some processes may be contained wholly within one function, however most processes are cross-functional, spanning the white spaces between the boxes on the organizational chart. Some processes result in a product or service that is received by the organizations external customers, while other processes are invisible to the external customer but vital to the effective management of the organization. Processes can be classified in different categories and levels."

2.7.2.2 Characteristics of Processes

In their study, Smith and Fingar (2003:47) acknowledged that "business processes display certain characteristics." They identified the following as the most appropriate characteristics:

- "Large and complex, involving end-to-end flow of materials, information and business commitments;
- Dynamic, responding to demands from customers and changing market conditions;
- Widely distributed and customized across boundaries, within and between businesses, often spanning multiple applications on disparate technology platforms;
- Long-running, a single instance of a process such as "order to cash" or "develop product" may run for months or even years;

- Automated – at least in part. Routine or mundane activities are performed by computers wherever possible, for the sake of speed and reliability;
- Both functional and technical in nature;
- Dependent on and supportive of the intelligence and judgement of humans. People perform tasks that are too unstructured to delegate to a computer or that necessitate personal interaction with customers. People also make sense of the rich information flowing through the value chain, solving problems before they irritate customers and devising strategies to take advantage of new market opportunities;
- Difficult to make visible. In many organizations business processes have been neither consciously visible nor explicit. They are undocumented, embedded, ingrained and implicit within the communal history of the organization, or, if they were documented, the documentation or definition is maintained independently of the system that supports them;
- Have a beginning and an end;
- Happen by means of different activities;
- Transform "something" from an input to an output;
- Dependent on man, machine, and material intervention;
- Can be located horizontally across business entities;
- Can be lateral within one business entity;
- Can have a different function or classification (Governing processes, Value-creating processes, Enabling processes, Asset-creating processes);
- Can be broken up in different levels of detail (From enterprise-wide to individual activities); and
- Can be complex or simple."

2.7.2.3 Process Classification

Hayden and Drath (2004:31) point out that "processes can be classified according to the overall functionality they perform." Processes can be classified in the following four categories (See figure 2.5):

- "Governing processes: Processes that direct other processes (planning and strategy development);
- Value-creating processes: Core processes that provide value to customers (provide authorizations and process transactions);
- Enabling processes: Process that enables another process to be performed (legal advice, financial management and training); and
- Asset-creating processes: Processes that create, manage and maintain infrastructural assets that leverage and enable value-adding processes."

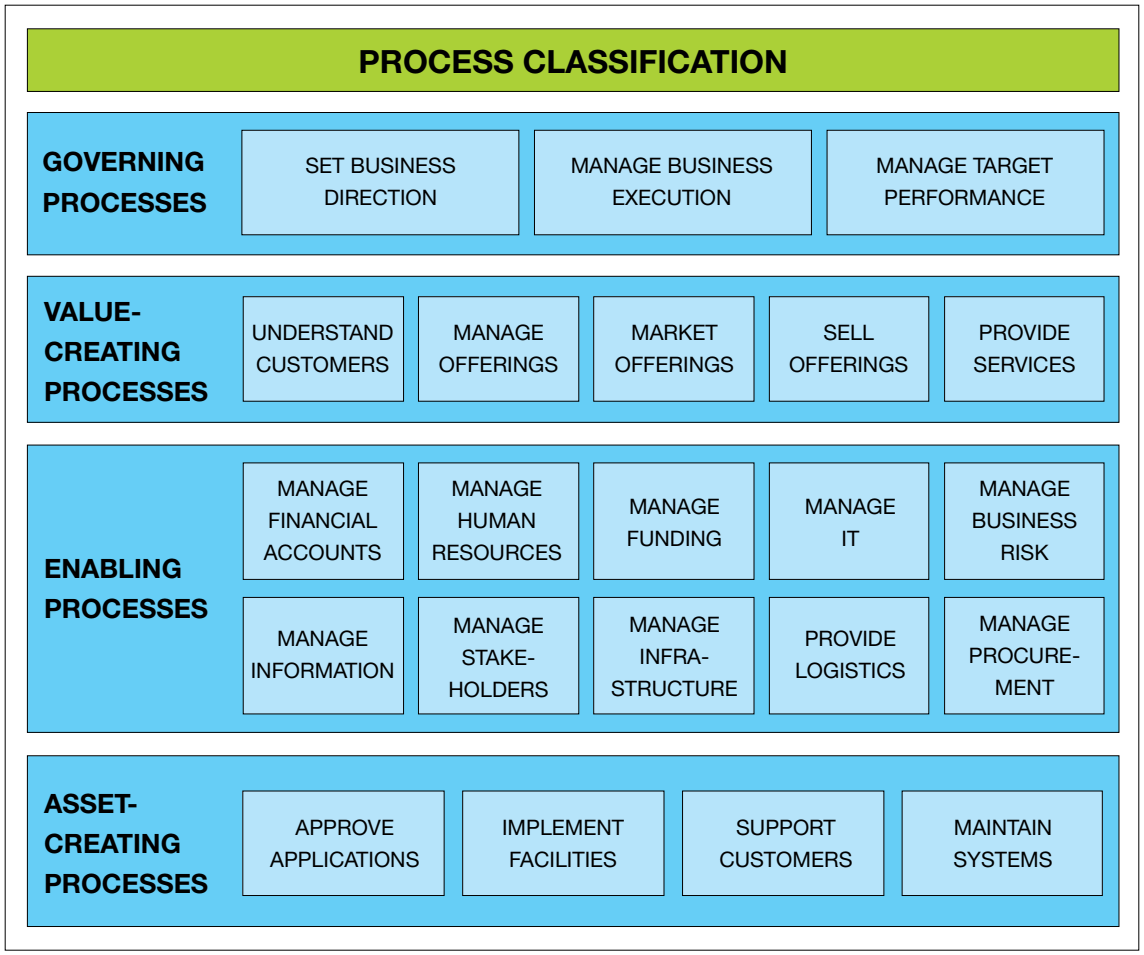

Figure 2.5 Process Classification (Hayden and Drath, 2004)

Lillrank (2003) extends this classification by stating that "processes can further be classified into three types, e.g. standard processes, routine processes, and non-routine processes. Standard processes are set up to deal with a single variety using binary logic. Routine processes can distinguish a limited amount of variety using fuzzy logic. Non-routine processes are open systems in which unrestricted variety is interpreted and meaning is assigned."

2.7.2.4 Process Taxonomy

Hayden and Drath (2004:29) refer to a Taxonomy (See figure 2.6) as "a classification system that partitions a body of knowledge, for example - all processes in a value chain or functional area are classified into main and sub-process pieces and defines the subordinate relationships between the respective levels of processes through decomposition. Taxonomy is used for classifying and understanding all processes in the value chain, product or department, as well as the scope and complexity of their business and business processes. Taxonomy can be designed to classify processes according to the preferred format, for example the organization's value chain, functional areas or product." They point out that Taxonomy:

- "Provides 'shared meaning' in an organization through the use of common language;
- Provides a centralized, integrated mechanism for locating similar items in a body of knowledge;
- Provides a 'layered' view of information in a body of knowledge, from overview level to detailed level;

- Demonstrates relationships between the various parts of a body of knowledge; and
- Prevents duplicated efforts in developing bodies of knowledge within large organizations where independent groups tend to 'reinvent the wheel' over and over again."

Hunt (1996:24-25) also refers to Taxonomy when he states that "a process hierarchy is extremely important and can provide a disciplined way of describing the detailed structure of your processes and how they relate."

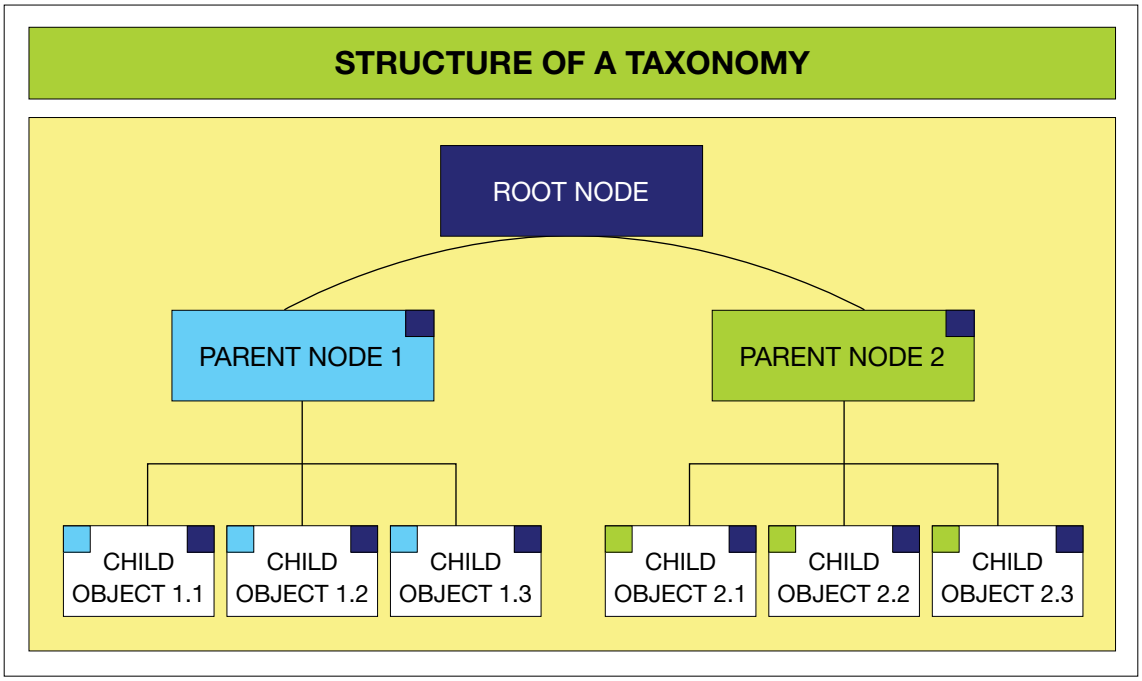

Figure 2.6 Structure of Taxonomy (Hayden and Drath, 2004)

2.7.2.4.1 Value Chain Taxonomy

Hayden and Drath (2004:29) refer to a value chain as "a sequential set of high-level primary and support processes that an enterprise performs to turn inputs into value-added outputs for its internal or external customers. At the highest level, process decomposition reflects a value chain, which defines the organization in terms of the highest-level business processes that get performed." The authors further state that "value chain taxonomy (See figure 2.7) could include processes on all levels."

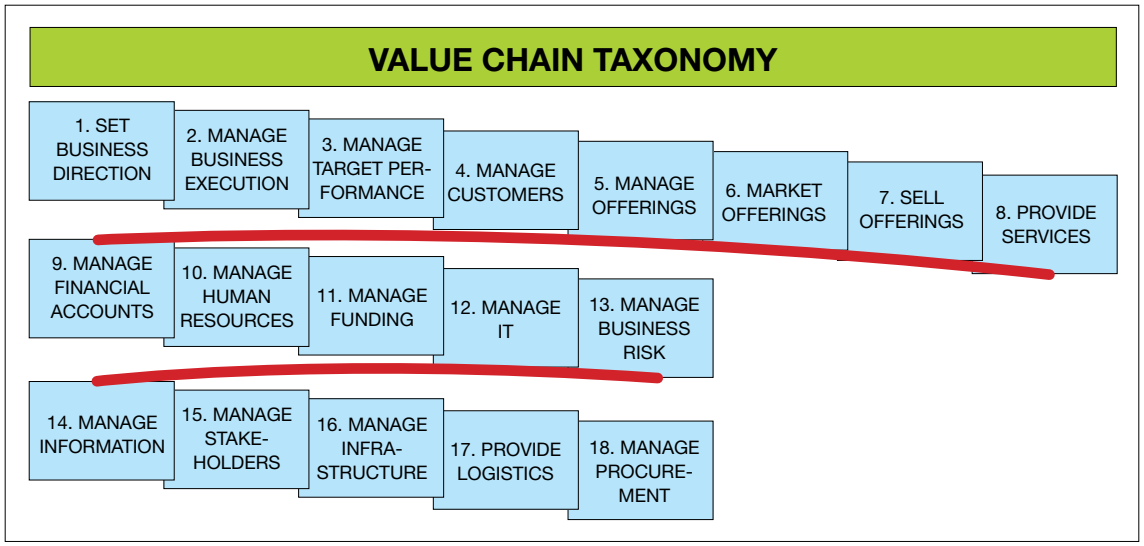

Figure 2.7 Value Chain Taxonomy (Hayden and Drath, 2004)

2.7.2.4.2. Functional Taxonomy

A functional taxonomy (See figure 2.8) classifies all processes according to the functions performed within a specific department. The classification normally comprises individual processes within the function or business unit and do not necessarily constitutes an end-to-end or value chain view.

FUNCTIONAL TAXONOMY

CREDIT CARD DEPARTMENT

ACCOUNTING	AUTHORIZA-TIONS	CALLCENTRE	PROCESSING	CUSTOMER SERVICE	FRAUD	OPERATIONS
Accounting – Master Card Incoming Chargeback Reconciliation Accounting – VISA Card Journal Accounting – VISA Incoming and Outgoinng Chargeback Reconciliation	Authorization – Cancel outstanding authorization Authorizations – Branch and Foreign Credit Card holders (Cash) Authorizations – Branch and other Banks Cardholders (Cash)	Call Centre – Handle telephonic balance enquiries from Card Holders Call Centre – Handle telephonic enquiries from clients Call Centre – Prepare Credit Card Claims	Credit Processing – Card Renewal Credit Processing – Emergency Replacement Cards Credit Processing – Process Advance Credit Card Renewal Credit Processing – Process new applications	Customer Services – Card cancellation Customer Services – Card distribution at Card Centre Customer Services – Card distribution in Provinces Customer Services – Cash advance	Fraud – Check Acquirer Log report for electronic transactions Fraud – Check Cards on manual and electronic transactions Fraud – Check Issuer Log report Fraud – Check manual Merchant slips – not on us Fraud – Check manual Merchant slips – on us	Operations – Card Application Embossing Operations – Cash Advances Operations – Credit Card Cancellation Operations – Manual Payments Operations – Pre-Edit Reports

Figure 2.8 Example of Functional Taxonomy (Compiled by Researcher)

2.7.2.4.3 Product Life cycle Taxonomy

Product life cycle taxonomy (See figure 2.9) classifies all processes related to a specific product life cycle. This type of Taxonomy normally constitutes an end-to-end or value chain view as related to the specific product.

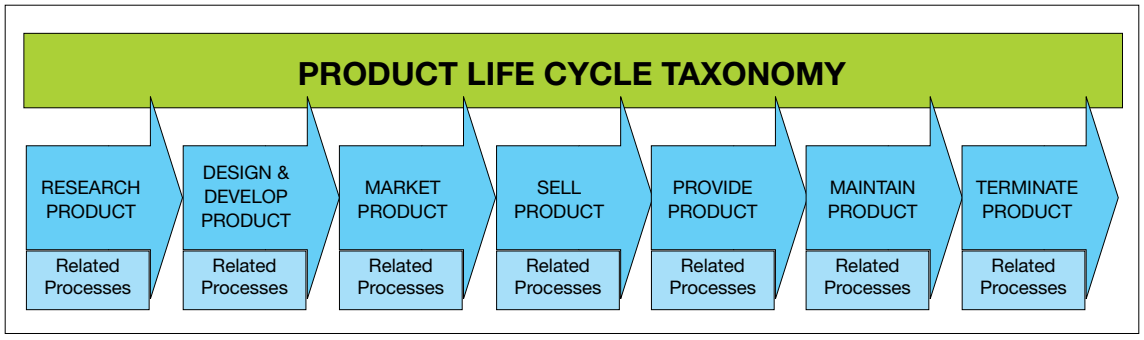

Figure 2.9 Example of Product Life Cycle Taxonomy (Compiled by Researcher)

2.7.2.4.4 Process Decomposition

According to Hunt (1996:3), "decomposition entails the partitioning or breakdown of a process map's functions into its different components (horizontal or vertical) and levels (enterprise level, main process level, sub-process level, activity level and task level)."

Hayden and Drath (2004:27) also suggest that "process decomposition defines processes from the highest level, which describe "what gets done", down to a reasonable level of detail, which describes the "how it gets done"." (See figure 2.10) - but indicates that "the decomposition does not refer to a specific sequence or role-players."

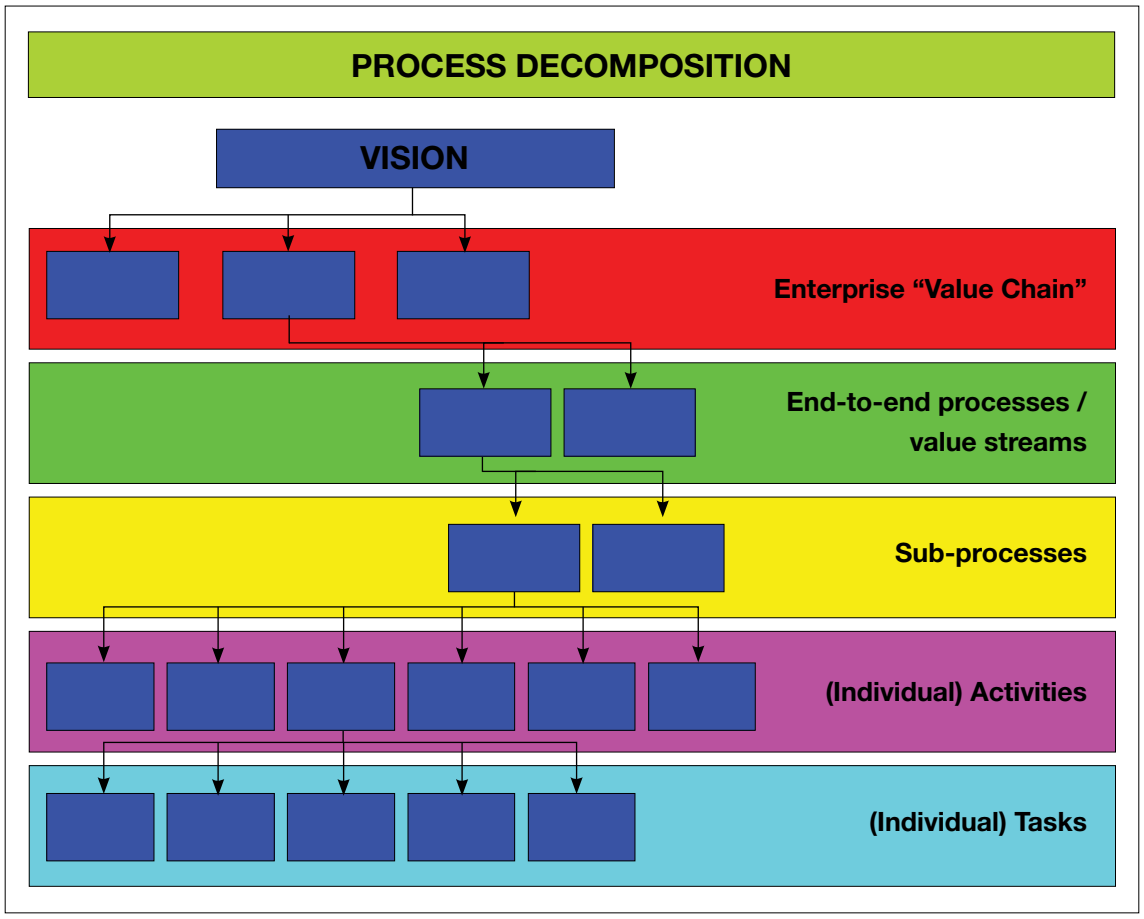

Figure 2.10 Process Decomposition (Hayden and Drath, 2004)

2.7.2.4.5 Process Levels

Hunt (1996:52-54) indicates that "process levels (See figure 2.11) imply the "level" of detail that can be included in the specific process map. At the enterprise level, no detail is included but single statements represent the level. At the lower levels, the description will be extended to include unique processes and activities that in most cases will only relate to one unique area and can not be applied to any other environment."

"The intended use of the process map or taxonomy will determine the level of the process map as well as the comprehensiveness of the detail."

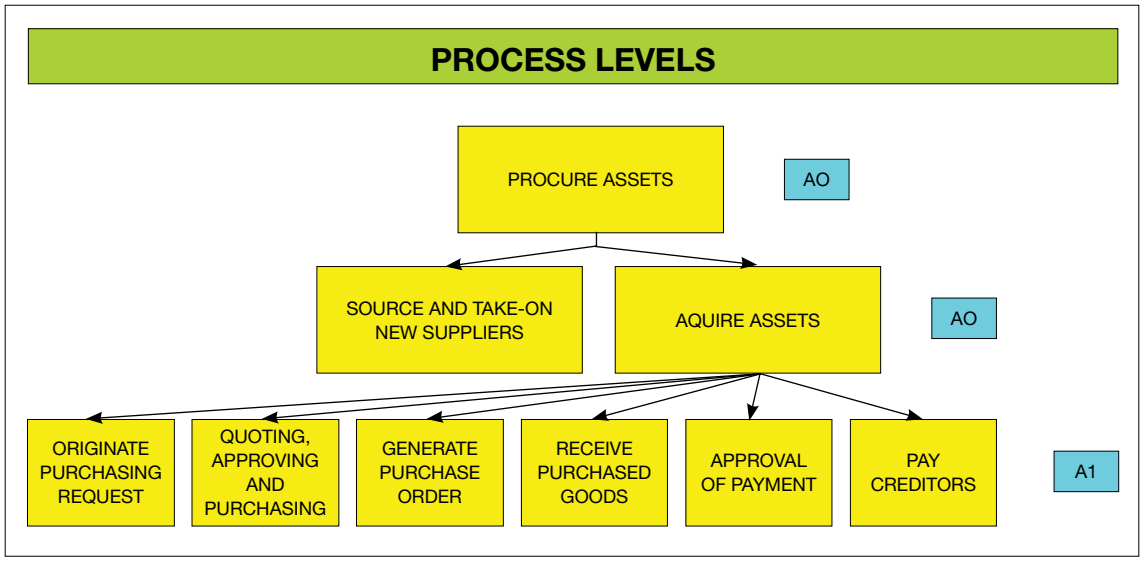

Figure 2.11 Process Levels (Hunt, 1996)

2.7.2.4.5.1 Enterprise level

Van Wyk and Vorster (2003:1-14) indicate that "the enterprise level constitutes the highest-level description of the organization's processes and that the enterprise level provides a horizontal view of the organization, identifying the top level of involved business areas."

According to Hunt (1996:52), "with high-level process mapping the intent is to obtain a manageable overall picture of the key processes, reflecting the complete chain of processes across the entire business."

2.7.2.4.5.2 Main or end-to-end value chain process level

Van Wyk and Vorster (2003:1-14) maintain that "main or end-to-end process activities run across organizational or divisional boundaries and represent the activities needed to deliver fulfilment to the customer from start to finish." They note that end-to-end processes:

- "Represent the process path of the major logical inter-relationships between the client and internal business areas or functions;
- Define the "what" and not the "how" of the process;
- Show the generic nature of the business;
- Have no constraints; and
- Are sequential in nature."

2.7.2.4.5.3 Sub-process level

Van Wyk and Vorster (2003:1-14) state that "sub-processes contain activities that are usually executed within one organizational department or division by different role-players within that specific department." The sub-process level includes:

- "The representation of the sub-process path of the logical process through functions, departments and jobs;
- The defining of the "how"," where" and "when" of the process;
- The sequential nature of process activities;
- Shows the business constraints; and
- Shows the interfaces to the system, also indicating the type of system."

2.7.2.4.5.4 Activity level

According to Van Wyk and Vorster (2003:1-14), "the activity level represents the scenario where each activity is performed by a single role-player within one department or section."

2.7.2.4.5.5 Task level

Van Wyk and Vorster (2003:1-14) point out that "the task level represents individual tasks making up the activity. A task is usually executed without interruption and constitutes the lowest level of decomposition."

2.7.2.4.6 Process Modeling/Mapping

According to Hunt (1996:96-97), "modeling is the act of developing an accurate description of the activities, work, data, and procedures performed by all resources in an end-to-end process, such as human, machine and system. When a process is modeled the interrelationships of the specific activities, work and data that make up a process at any level of detail become visible. This allows the organization to critically analyze each activity (task) that forms part of the process in their search for improvement opportunities. Because the facts about activities are displayed in both graphical and narrative form, this analysis is objective, rather than subjective."

Scheer, Abolhassan, Jost and Kirchiner (2003:4-10) state that "Business Process Modeling is an integral part of the design and implementation of business processes to:

- Provide a visual description of the business environment;
- Establish common language for business owners and business;
- Link business processes and technological functionalities; and
- Ensure the integration and completeness of all business processes."

According to Hunt (1996:102-103), "a process model is a graphical description of a process, showing the sequence of process tasks that is developed for a specific purpose and from a selected viewpoint. Process models are hierarchical in nature. This means that they start with a high-level view which is then successively decomposed into layers of increasing detail."

Van Wyk and Vorster (2003:1-14) define a process map as "a pictorial language demonstrating the processes of an enterprise that is also called a line of visibility chart, which graphically indicates the business processes as well as the data that flows between these processes." They further also identify the purpose, aims and benefits of process maps:

- "The documentation and evaluation of the business process flows between functions, departments and jobs;
- The highlighting of service levels and conflict between the organization and the client;
- The identification and focusing of areas that need to be redesigned; and
- It serves as a blueprint for systems development."

The Wikimedia Foundation, Inc (2006) describes process maps as indicating the following:

- "A proper trace what actually happens during a process;
- The point of view of an external observer who looks at the way a process has been performed and determines the improvements that have to be made to enable process effectiveness and efficiency;
- Indicate rules, guidelines, and behavior patterns which, if followed, would lead to the desired process performance. These range from strict enforcement to flexible guidance;
- Provide explanations about the rationale behind the design of these processes;
- Explore and evaluate several possible courses of action based on rational arguments; and
- Establish an explicit link between processes and the requirements that they are to fulfil."

2.7.2.4.6.1 Types of process models/maps

Processes reflect a combination of attributes that can include work steps, activities, tasks, data and documentation. Numerous process models such as workflow diagrams, activity flow diagrams, data flow diagrams and decomposition diagrams have been designed over the years to enable the analysis and improvement of the different attributes of a process.

Workflow diagrams

Hunt (1996:1-5) describes workflow diagrams as "the major output of the process map, drafted on either conventional paper drawing or created by computer-aided process mapping techniques." He further states that "the purpose of a work flow diagram is to show the flow of work between processes and the organizations to which the processes belong. With such a comparison, the areas where performance enhancement is required, are highlighted. Flows, which may have work product type labels, are drawn between processes. These flows depict the transfer of outputs (work results) produced by one process to another process. Flows between processes contained in different organizational units depict the flow of work between different organizations within the enterprise."

In a comprehensive process management manual, Sterling Software Inc (2001) states that "a work flow diagram displays three types of processes, i.e. decision processes, operation processes and committee processes."

- "A Decision Process has various possible outcomes. Each time a Decision Process executes, a test is performed to determine which outcome(s) will actually be produced;
- An Operation Process performs a series of steps that result in one particular work product type being passed to another process; and
- A Committee Process is the joint responsibility of one or more organizational units at the same point in time. Both Operation and Decision Processes may also be a Committee Process."

Activity flow diagrams

Sterling Software Inc (2001) suggests that "the purpose of an activity flow diagram is to show the flow

of work between activities and the jobs to which the activities belong." They indicate that "activity flows are drawn between activities, which depict the passing of outputs (work results) produced by one activity to another activity. Flows between activities contained in different jobs depict the flow of work between different jobs within the enterprise. Both decision activities and operation activities (as discussed above) are contained within an activity flow diagram."

Data flow diagrams

Sterling Software Inc (2001) points out that "the purpose of a data flow diagram is to show the flow of data through a business activity or automated system. Each data flow diagram shows the data flowing between processes, data stores and external agents that represent one level of process decomposition. The company further explains that the flows, which are drawn between objects, depict the passing of information or data from one object to another object."

Decomposition diagrams

Sterling Software Inc (2001) explains that "the purpose of the decomposition diagram is to show how an object of one type, i.e. process, organizational unit, problem, goal location, or subject area breaks down into other objects of the same type. The decomposition diagram can show many levels of the hierarchy for an object type."

2.7.2.4.7 Standards of Process Models/Maps

Van Wyk and Vorster (2005:1-10) explain that "every process map, irrespective of level, has several attributes that need to be defined in text or numbers. Standardizing symbols, text, and structure of the process map format to be utilized in the organization contributes to understanding and managing the process maps."

They further state that "standards lay down rules, guidelines and behavior patterns which, if followed, would lead to the desired shared meaning, quality and performance. These standards range from strict enforcement to flexible guidelines. The following attributes regarding process maps should be standardized throughout the organization:"

2.7.2.4.7.1 Naming conventions

Van Wyk and Vorster (2005:1-10) deem it crucial "to implement standard naming conventions for every attribute on the process map to ensure that everyone in the organization complies with these standards, rules and definitions. This will ensure conformity and an enterprise-wide understanding. Organizations today design their own templates that reflects all the information needed to identify and describe the different attributes necessary to manage their processes enterprise-wide."

Any of the following attributes can make up the information on the process map:

Process title or name

"The process title or name should be fully descriptive of the process in order to enable users or readers to identify the process by name."

Process information

"Process information is usually contained within the information band directly underneath the title

band." This information is utilized to identify factors such as:

- "Level of process;
- Business unit name or description;
- Product or service category and name where the process belongs;
- Name and designation of person supplying and validating information, process owner and the analyst that compiled/reviewed the process map;
- Date when the process map was compiled/enhanced/revised; and
- Number and version number of the process map according to the taxonomy used."

Swim lane or band descriptions

"Various attributes are contained within the swim lanes and should also be standardized to enhance understanding between units, i.e. process steps, committee steps, decision steps, text blocks, goal blocks, problem blocks, system blocks, indicators of phase, time, and cost, as well as approval information, together with header and footer details."

"Supportive information is located behind blocks and can be inclusive of comments, process logic, definitions, and references."

2.7.2.4.7.2 Language and spelling rules

"Every process map, irrespective of level, should carry sufficient text to describe the different attributes on the map. Standards and rules on aspects such as the utilization of nouns, case and numbers should be determined for every attribute within the model or map."

2.7.2.4.8 Process goals

"Processes cannot be performed without an aim or a goal. Process goals must be aligned to the organizations goals to add value. Within the end-to-end process, several sub-processes and individual process steps are performed and all of these should have a goal."

Overall process goals

Hunt (1996:7) states that "each process exists to make a contribution to one or more enterprise business goals. Therefore, each process should be measured against process goals that reflect the contribution that the process is expected to make to the business enterprise goals. Process goals are derived from three sources, namely business enterprise goals, customers' requirements and benchmarking information. In all cases, the key process-mapping goal is for the key processes to be linked to customer and organizational requirements."

Process step sub-goals

Hunt (1996:10) states that "process sub-goals need to be established after each process step that has a critical impact on the ultimate customer-driven process goals."

Functional goals

Hunt (1996:6) explains that "functional activity goals established at the business enterprise level should be modified, if necessary, to reflect maximum functional contributions to the process goals and sub-goals." He argues that "since the purpose of the function is to support processes, it should be measured by the same degree to which it serves those processes. When functional goals are

established, organizations ensure that the team meets the needs of both their internal and external customers. This in effect means that if a process flows horizontally over more than one function, like sales, finance and credit, each function must modify their sub-process and functional goal to correspond to the main process goal."

2.7.2.4.9 Quality Control on Process Maps

In order to ensure completeness, understanding and re-usability of process maps, the maps should be on a specific level of quality. This can only be achieved if the maps are subjected to frequent quality reviews.

Hunt (1996:218-221) subscribes to the quality review cycle when he states that "it is important to establish an informal process map review cycle to "proofread" the developing map and record all decisions in writing. This ensures that the process map reflects the best effort of a committed team."

Van Wyk and Vorster (2003:1-14) strongly emphasize that "quality reviews must be performed on all process maps to ensure they conform to the laid-down organizational standards before publication. Interim quality reviews can be performed on business processes on-line during enhancements in order to eliminate unnecessary delays towards the end. Part of quality control is sign-off by the process owner of the process map or model." They are of the opinion that "there should be sufficient supportive documentation such as a standard quality checklist (See figure 2.12) to assist administrators in their quality review task to ensure conformity to the quality standards."

Process Modeling Standards Checklist				
No	Section	Items	Yes	No
1	Diagram Name	Verb\Noun Style?		
2	Model Info	Process Value Chain Levels indicated?		
		Business Unit indicated?		
		"Validated by" field completed?		
		Process Owner indicated?		
		"Goal" completed starting with "To..."		
3	Process Map	"BAND" Names completed?		
		"Processes\Activities" named Verb/Noun style?		
		"Workflow connectors" (Inputs/Outputs) Named?		
		Name of System indicated on "System shapes"?		
		Data lines indicated where applicable (Inputs/Outputs)?		
		Process number indicated where applicable?		
		Child processes decomposed – Child Diagram number and name same as the process shape on parent diagram?		
4	General	All text "English writing style"?		
		Shapes neatly aligned?		
		Hyperlinks indicated and valid?		
		"Signed off" (Before publishing) Stamp removed?		

No	Section	Items	Yes	No
4	General	Diagram neatly spaced from top left corner?		
		Bands sized correctly to eliminate “white spaces”?		
		Correct spelling used?		
		Manuals Updated?		

Figure 2.12 Standards Checklist (Van Wyk and Vorster, 2003)

2.7.2.4.10 Change Control and Version Control

Van Wyk and Vorster (2003:1-14) acknowledge that “process maps are constantly updated and changed within the process improvement cycle. In order to maintain control and history on changes and processes, an audit trail on process improvements must be maintained. A change control system, which includes version control, must be implemented. The changed maps should remain part of the current repository categorised and stored in such a fashion (view only) that retrieval is allowed but that no confusion exists between current and previous map versions.” They also state that, “during the implementation and communication of the new process, the version number should be visible to ensure that only the current and signed-off process is being followed.”

2.7.2.4.11 Critical Success Factors applying to: Process Architecture

It is quite clear from the literature that a high premium is placed on the accuracy and completeness of attributes on process maps and aspects such as quality control and review to ensure that process maps measure up to the function they should perform. The following have been identified as Critical Success Factors within the process architecture domain that management should have control over to ensure successful management of the domain. These factors will form the basis of the BPMCAM.

The process architecture concept

- The concepts and definitions of process and process architecture must be understood and accepted by all stakeholders; and
- The end-to-end process concept and ownership concept must be accepted in the organization.

Classification and taxonomy

- A process taxonomy or classification must be agreed upon and designed for the organization and all processes must be classified accordingly;
- All process maps must be structured according to the hierarchy or taxonomy with major functions on top and successive process map levels revealing well-bounded details;
- All process maps must be linked to the taxonomy to give an holistic view of the organization’s business processes in all areas;
- Interfaces between the high-level processes and sub-processes must be clearly indicated on the maps; and
- The process maps must clearly indicate which functions the system must perform and process maps must be utilized when systems are built.

Modeling/Mapping

- An agreed-upon process modeling methodology, inclusive of types of models and format of models, must be implemented and adhered to within the organization.

Standards of process models

- Standards regarding every attribute on the process map must be determined and documented;
- All staff members responsible for process map modeling must be fully trained in the mapping standards;
- Well-defined service level agreements must exist, with clear links to documentation standards;
- The infrastructure and organization must be designed to promote and share standards on business process documentation, technical documentation and training material between stakeholders; and
- A standard framework for documentation and procedures must be defined and monitored.

Quality control

- Quality regarding process maps and documentation must be defined by staff in the Business Process Management environment, with clear roles and responsibilities related to the quality assurance processes and quality control procedures;
- The quality assurance program that has been implemented must have well defined measurable quality standards; and
- Quality education and training programs must be compulsory for all persons mapping and using process maps.

Change and version control

- A well-controlled change control and version control process must be in place and controlled.

2.7.3 Systems and Information Architecture

With the growth of computerized business systems, the IT function initially tended to cease ownership of the process function. Over the past decade organizations have realized that the ownership for business processes does not reside within the IT domain, but with the business units and business owners. Information systems today form the basis of many business processes and will always remain extremely important in the Business Process Management environment.

Scheer (1998:88) states that “systems architecture shows how systems link and interoperate and may describe the internal construction and operations of particular systems within the architecture. For individual systems the systems architecture includes the physical, connection, location and the identification of key nodes, circuits, networks and platforms and specify systems and components performance parameters.”

Smit (2000) defines systems architecture as “a business strategy driven set of objects or artifacts (in textual and model format) describing an enterprise’s information value chain, comprising business processes, events, data relationships and data entities (right information; right time; right people) as well as governance that consists of:

- Principles and policies;
- Roles and responsibilities;

- Standards and procedures;
- Models and meta data; and
- Repositories and tool sets."

Yaman (2001) argues that "IT organizations tend to see a set of back-end systems and infrastructure that they must keep running. Corporate management views the same system as a series of business processes that should help keep its organization competitive. Like oil and water, the two perspectives continue to coexist but rarely mix into one cohesive strategy. With the advent of the Web, today's IT department must constantly remind itself that it is part of the team that interfaces with customers. While consumer Web businesses understand this relationship, it is a new concept for many organizations that operate within the business-to-business space."

Yaman (2001) further states that "it is all-important that IT finds itself and requires IT to think more about the processes, the customer and the business objectives than about the actual technology alone. The technical components are not unimportant, but they are secondary. In short, the technical components must be intimately tied to business processes, strategies and objectives. On the Web, business strategy and technological implementation must come together to deliver an optimum end-user experience."

Adshead (2002) adds to the view that IT and business share the process management environment when he states that "Business Process Management is a way of creating a level playing field for business processes and technology. On the other hand, while organizing the applications and the business processes was formerly a separate task, Business Process Management allows the business and the technology management to work together to achieve maximum return on investment from an equal-position footing with a common set of business priorities. The business' workflows and information need to cross boundaries, such as engineering, procurement and certification, calling for an end-to-end approach. The ability of a software platform to be easily modeled to such processes would reveal a convergence offering to users of what, in the past, were purely technical considerations." "Business is end-to-end, and as Business Process Management is trying to combine the business and the technology it follows, it becomes clear, that no single supplier can fully supply what is needed. Business Process Management aims to bring about a situation of constant reengineering of business processes. The advanced forms of workflow that would result could allow users to be brought online and involved in changing processes."

2.7.3.1 Process Modeling Software Packages/Tools

Except for the management of business processes via computer systems, Business Process Management has another interest in the support that they receive from the IT area. Software packages that are utilized to maintain and improve processes have become an integral part of the business systems, i.e. the SAP and ARIS systems. Over the past years numerous software packages have been developed to be utilized to map processes. These process-mapping tools can be divided into three general categories:

- Flow Diagramming Tools;
- CASE Tools; and
- Simulation Tools.

2.7.3.2 Business Process Automation

Lynn (2003) states that "Business Process Management details how a business operates by analyzing the roles of personnel, areas of business, and processes." The above author further argues that "Business Process Automation goes one step further by automating various aspects of those roles, areas and processes to ensure consistent and repeatable performance."

The above mentioned author points out that, "using Business Process Management to automate activities also helps to monitor the progress or bottlenecks of an organization. Once implemented, automated business processes can be used in setting up information for training programs, or to provide standardization of processes internally for customers and/or suppliers."

Lynn (2003) acknowledges that "since an important element in setting up a workflow process is the selection of the correct Business Process Management tool, organizations should further consider what such a tool will provide. It is further important that organizations select a tool that provides the ability to model the process as well as to integrate the technology. Workflow solutions should incorporate reporting and monitoring capabilities as Management will require at-a-glance reporting and even better, these reports should be easy to export to other systems and technologies."

2.7.3.3 Process Repository

Van Wyk and Vorster (2003:1-14) emphasize that "the collection of reusable components or models is of little use if not stored in a central repository or database." They argue that "if you do not know what you have, or you do not know where to find it, you cannot reuse it." They are of the opinion that "repository technologies allow an organization to collect information once, catalogue and store it and retrieve it any time it is needed. The process repository must be centralized and the only area that contains all the organization's process maps, providing a central view of the truth."

2.7.3.4 Links to other Systems

Van Wyk and Vorster (2003:1-14) states that "processes do not exist in isolation but that they are intimately linked to business policies, rules, regulations and standards. In large organizations, documentation such as policies, procedures, circulars and business plans reside within specific systems that are easily accessible to all users. If these documents are not an integral part of the process repository, a link should exist between the systems to allow users to access process-related documentation.

2.7.3.5 Publishing

Van Wyk and Vorster (2003:1-14) maintain that "the status of a process is dependent on the stage within a process's development. Whenever a process is created or under review the status of the process will be indicated as "To-Be". Only once the process has been completed and approved, will the status be changed to "As-Is" and become available to the end-user for reference and use. Only a System Administrator or a designated Business Unit Administrator should be able to change the status of a business process. Process models for publishing must conform to the required organizational standards and must be signed-off by the relevant Process Owner prior to publication. Publication refers to the placement of a signed-off process model or map on an intranet or database where it is accessible as a view-only document for the entire enterprise."

2.7.3.6 Change Control

Leavitt (2003) is of the notion that "change control includes the control of changes to processes as well as the maintenance of the repository. It also includes the way in which requests for service and process enhancements will be managed, monitored and implemented and stipulates regulations for the monitoring of unpublished or long-unchanged models."

The same author suggests that "there should be a formal process with compulsory documentation to be completed, approved and well communicated and accepted by all process owners and users. Change control should be enforced and no deviation from the process should be allowed." He indicates that "deviations from the process will eventually result in chaos, as changes to processes will occur without the process owner's knowledge. Uncontrolled changes specifically create havoc when shared processes and systems are involved."

Leavitt (2003) states that "change control may generally refer to any program aimed at driving a change through an organization in an active, managed way. Particularly, the thinking behind Change Control is that all processes will require to be changed over time, but since it is impossible to determine in advance exactly what the nature of those changes would be, readiness to monitor and control change is pivotal."

According to Henning (2002), "changes to processes and systems should be well documented and change request documentation should include a change request form that reflects the detail of the requested change in order to ensure documented evidence of the scope of the change." Such request should further include:

- "Business reasons for the change;
- Envisaged risk impact of the change;
- Back-out plan if change is not successful;
- Type of change requested;
- Systems and processes to be impacted by the change;
- Detail of requestor of change;
- Detail of all signatories approving the change (Change request sign-off sheet); and
- Version number related to the request."

Henning (2002) further states that the areas to perform the sign-off will normally include areas such as:

- "All system owners;
- Business process owner;
- Training and Development;
- Communications;
- Policies and Procedures; and
- Change Control Forum."

The same author is further of the opinion that "the paper-based change request documentation can and should be replaced with a systematic workflow to control and enforce change management."

2.7.3.7 Critical Success Factors: Systems and Information Architecture

According to Pellissier (2001:10-13; 93) "there will always be an increased demand for information that needs to be supported by a supply of information. The ease of change or sabotage of information within a system has overwhelmed organizations, economies and countries and this is one of the main reasons for control of the data and information within organizations' systems. Technology will remain the real engine that drives the information and biotechnological ages. IT and knowledge workers were the driving force of the information age (1960 to 2000). Technology and information are the driving forces of the biotechnical age that started from 1999."

The following Critical Success Factors relate to systems and information architecture that are directly linked to the Business Process Management environment and were identified in the literature. These factors will also be included in the BPMCAM:

- The organization must have a formal systems architecture that governs the enterprise information value chain;
- Cooperation between Business Process Management and Technology should exist to ensure maximum benefit for the organization;
- The organization must have approved software modeling tools implemented enterprise-wide to ensure standardization and shared meaning;
- The Business Process Management team must be fully trained to use the mapping tool;
- Business Process Automation systems must form part of the organization's current and future systems and process architecture;
- A centralized process repository must be used to ensure one approved view of process maps and processes in general to ensure consistency across all business units;
- The Business Process Management system must be able to track individual changes, as well as change process parameters;
- A systematic solution must be in place to link systems that carry business process-related information;
- All signed-off business processes must be published on an organizational public domain that allows access in accordance with user rights and authorisations; and
- A formal change control system, supported by the appropriate documentation, must be in place to ensure that changes are accounted for and that all process maps within the repository are current and updated.

2.8 OPTIMIZATION

Optimization as defined in the Oxford Advanced Learner's Dictionary (2003:821) refers to "Making the best of something".

More specifically to the Business Process Management domain, optimization is the defining, implementing and maintaining of methodologies and models to constantly improve, review and measure business processes. It also ensures that the organization's individual business processes are optimized. The definition reflects the continuous and dynamic state that must exist within an organization to utilize business processes as a competitive edge.

The literature emphasizes the following criteria for optimization, i.e. process improvement, process review, standards and measurement, and are supported by various Critical Success Factors as displayed in Figure 2.13.

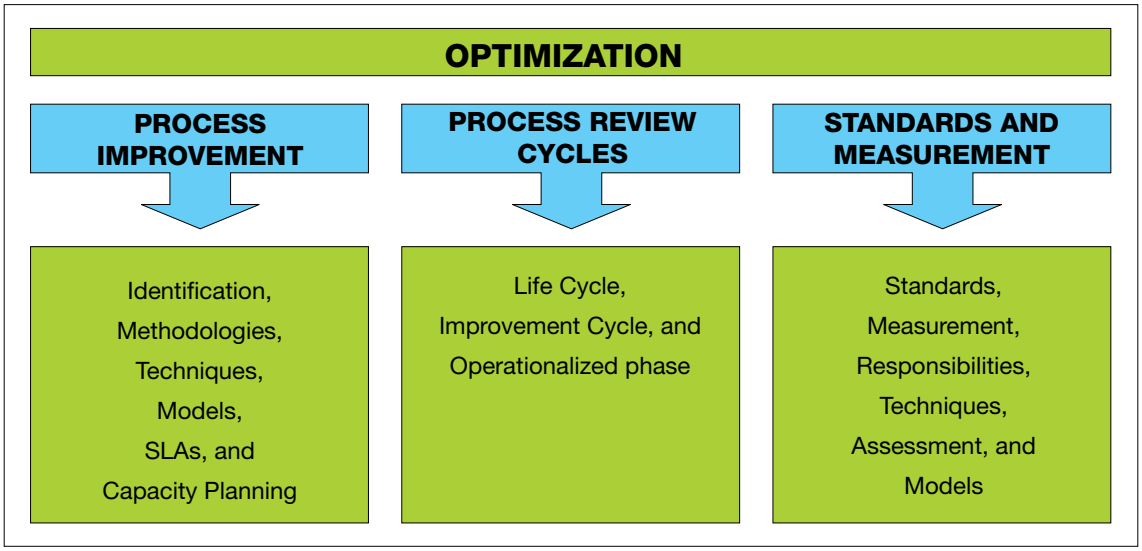

Figure 2.13 Decomposition of Business Process Optimization (Defined by Researcher)

2.8.1 Process Improvement

Hayden and Drath (2004) are of the opinion that "by utilizing a defined process, organizations strive to achieve certain outcomes." These include:

- "Customer satisfaction;
- Reduced cycle times;
- Minimal rework;
- Reduced redundancy;
- Fewer defects;
- Improved decision making as near as possible to client interface;
- Maximum human-resource utilization;
- Lower costs;
- Information effectiveness; and
- Effective and timely Business Process Management."

"Essentially, process optimization means that all or most of the required outcomes will be fully realized."

The above authors state that "one should keep in mind that the term Business Process Management is also utilized in the literature to describe the actions of process improvement or optimization."

2.8.1.1 Business Process Management: Process Improvement Perspective

The Centre of Strategic Leadership Studies (1996:2-3) advocates that "process improvement involves systematically analyzing and changing process factors so that they work together better to improve process quality. Mission effectiveness is increased through improvement, redesign or the innovation of processes. Processes are improved when they are more predictable, cost less, and contribute

more to meeting mission requirements. Through process improvement, problems or errors could be prevented rather than fixed after they have occurred."

Khade (2003) points out that "process improvement does not happen overnight. First, there has to be a clear understanding of what should be accomplished. This is achieved by gaining input from all stakeholders that will be affected by any change in the process. An incomplete picture of the process will appear if this input is not sought. When it is determined what the output should be, the process must be developed." He states that "most improvement efforts fail because not enough time was taken to fully develop the improved process before implementation, or because those affected by the improvement were not consulted."

Reitsma (1999) is of the opinion that "process improvement refers to any process changes that eliminate waste, enhance flexibility or improve quality."

According to Smith and Fingar (2003:22), "agile Business Process Management enables the monitoring, continuous improvement and optimization of entire value chains. Moreover, complex processes are often combinations of sub-processes that may be standard, routine or non-routine. Attempts to manage the whole as if it were of one single type will create obvious problems. Process improvement and management should be adapted to the type of process."

The above mentioned authors also identified various characteristics of Business Process Management within the process improvement domain:

- "Business Process Management provides enhanced business agility, control and accountability. It will streamline internal and external business processes, eliminate redundancies and increase automation;
- Business Process Management provides a direct path from process design to a system for implementing the process. It is not so much "rapid application development" than it is removing application development from the business cycle;
- Business Process Management supports top-down and bottom-up process modeling, right across the value chain, involving all business process participants, systems, people, information and machines;
- Business Process Management is a platform for sharing end-to-end business processes in a manner analogous to the use of a database management system as a platform for sharing business data, both between applications and among business partners;
- Business Process Management is the platform upon which the next generation of business applications will be constructed;
- Business Process Management supports processes that inherently integrate, collaborate, combine and decompose, no matter where they were created and independent of the different technical infrastructures in which they exist. Business Process Management creates reusable process patterns;
- Business Process Management is defined by the ability to change business processes at a speed governed by the business cycle, either day-to-day, week-by-week or quarter-by-quarter, radically reducing the friction arising from today's endemic business and IT divide;
- Business Process Management supports the derivation of key business metrics – for example, activity-based costs – directly from the execution of business processes. Business Process

Management processes are accountable, transparent and persistent, and include all the information passed among participants over the process lifetime;
- Business Process Management radically simplifies the development of processes that span the value chain, eradicating the point-to-point integration problem that still plagues value chain execution today;
- Business Process Management supports the fluid movement, management and monitoring of work between organizations. It is the operational environment that underpins value chain integration and business process outsourcing;
- Unlike previous technologies, Business Process Management has the potential to automate the discovery of business processes arising naturally in the course of business operations, as readily as a database naturally fills with business data during use; and
- Business Process Management will enable the industrial-scale collaborative design of business processes among partners, and will provide the tools for the value management analysis of processes supporting virtual operations."

According to Tucker (1999:8-10), "real and sustainable competitive edge will be gained by concentrating on the following Business Process Management aspects as much as the process, and managing all of the processes so that each of them:
- Is owned by someone who is regarded as a role model process owner;
- Is stable, proven and fully understood by all those involved in it;
- Is operated by people who are highly competent and motivated and who are working with the process customers and suppliers to improve it;
- Is delivering exactly what the process customers expect on time every time;
- Has world-class systems and structures supporting it which have been optimized for it and use the latest appropriate technology;
- Is constantly delivering the right value to the business customers;
- Is always operating at world-class levels of efficiency; and
- Has a review program, which has systematically caused significant improvements to the process."

Porter and Tanner (2004:12-13) point out that "to achieve organizational excellence, the organization needs to practise a repeating cycle of the continuous improvement cycle (See figure 2.14). Irrespective of which cycle the organization utilizes, the cycle usually boils down to the following generic steps: plan, do, check and act."

Figure 2.14 Cycle of Organizational Excellence (Porter and Tanner, 2004)

2.8.1.2 Improvement Identification

Smith and Fingar (2003:90) state that "the process to be improved might be identified by management, the specific department where the process is performed or the individuals performing the task." The identification usually stems from one or more of the following reasons:

- "Excessive waste of material;
- Excessive rework or returned items;
- Unproductive units or equipment;
- Constant request for more staff;
- Work not finalized on time;
- Excessive overtime worked;
- Work not finalized according to specific quality;
- Major customer dissatisfaction;
- Dissatisfaction between units;
- Bottle necks;
- There is a visible gap between actual and desired process results;
- Problem occurs frequently;
- Duplicate or related activities;
- Multiple reviews and approvals;
- Multiple inspections;
- Inefficient activities;
- Too many hand-offs or movement of work; and
- Centralization or decentralization."

2.8.1.3 Process Improvement Methodologies

Sethi and King (1998:553-565) state that "the methodology prescribes the specific strategy that will be followed to improve the organization's processes. Depending on the magnitude of the problem and the severity or level of change or improvement needed, the initiatives can include any of the performance enablers:

- BPR;
- Business Process Improvement;
- Continuous Process Improvement;
- Project Management;
- TQM (Identifies and eliminates defects and waste);
- Just-in-Time (Operational flow eliminates waste, delay and unevenness);
- Six Sigma;
- Lean Six Sigma;
- Activity-based costing;
- Time and Motion Studies (Standard time needed per activity);
- Ergonomics;
- Cross-functional Process Design;
- Analysis and Mapping of "As-Is" process designs; and
- Staffing, Productivity Modeling and Accommodation Layout."

To Phipps (2001), "undertaking process improvement constitutes an action methodology that institutionalizes employee involvement and illuminates the relationship between what type of work is done and what results are produced for customers." A successful process improvement methodology should at large include the following steps:

- "Discovering customer expectations;
- Analyzing where and why the process falls short of those expectations; and
- Creating and implementing solutions to enable the process to meet or exceed customer expectations."

According to Hunt (1996:29) "there are three distinct levels of process improvement, each with its own considerations and organizational impacts. The term process improvement can encompass all three levels and the greatest opportunities for process improvement within the three levels are:

- Continuous Process Improvement (65 percent);
- Business Process Redesign (23 percent); and
- BPR (12 percent)."

Kreitner and Kinicki, (2004: 259) clearly states that "The job context includes the physical environment, the tasks one completes, the organizations approach to recognition and reward, the adequacy of supervisory support and the organizations culture." Process improvement teams should therefore acknowledge and include these contributing factors during process and task design as this will ultimately impact the job context and therefore organizational behavior.

Cummings and Worley (2005:331-347) advocate that there are three approaches to work design and therefore directly also to process design which also includes process improvement i.e. "the engineering approach, the motivational theories and the socio-technical systems method. They indicate that every approach has its own positive and or negative impact on the levels of the organization i.e. the individual, the group, the organization and the external environment of the organization."

"The engineering approach focuses on efficiency and simplification of processes and tasks. It results in traditional job and work group designs and is based on the work of Frederick Taylor. It clearly

specifies the tasks to be performed, the work methods to be used, and the work flow among individuals. It further creates traditional jobs where one person can perform the task i.e. bank tellers and further creates traditional groups where more than one person are involved i.e. assembly line workers." This specific approach has the following positive and negative outcomes i.e.:

Positive points:
- "Short learning period;
- Short work cycles with little mental effort; and
- Reduced costs due to lower skills levels needed."

Negative points:
- "Ignores workers social and psychological needs;
- Pose no challenge to man; and
- Competitive climate requires committed and involved workers that can make decisions."

"The motivational theories attempts to enrich the work experience by offering high levels of meaning, opportunities for autonomy, responsibility, closure, discretion and knowledge of results. The motivational theories are associated with the work of Herzberg, Hackman and Oldham, where Herzberg's motivators (increased satisfaction) and hygiene factors (prevent dissatisfaction) plays a major role." Critique against this approach includes:
- "Motivators and hygiene factors are difficult to measure;
- The absence of the inclusion of worker characteristics that can affect the response; and
- Failure to involve workers in the job enrichment process."

The above authors further identified at least four organizational systems that can constrain the implementation of job enrichment via process improvement:
- "The technical system – limit number of ways a job can be structured;
- The personnel system – formalized job descriptions that limits flexibility in changing peoples duties;
- The control system – can limit the complexity and challenge of a job; and
- The supervisory system – autocratic supervising cramps the autonomy of a job."

Cummings and Worley (2005:331-347) identify the "socio-technical systems method as currently being the most extensive body of scientific and applied work underlying employee involvement and innovative work designs. It is based on two fundamental premises i.e. an organization or work unit is a combined, social-plus-technical system, and this system is open in relation to its environment."

The same authors describe an organization or work unit as a "combined, social-plus-technical system where:
- The two systems (social and technical) are independent but related because they must act together to accomplish tasks;
- The two systems produces two kinds of outcomes i.e.
- Social – job satisfaction and commitment
- Technical – products, goods, services etc.
- The key issue is to design a relationship between the two so that both outcomes are positive (Joint optimization)."

To Cummings and Worley (2005:331-347) the most popular application of this approach as a process and work improvement approach is self-managed work teams implicating the following:

- "The process or unit is responsible for a complete product or service;
- The unit controls own task behavior, decision making and work methods;
- Multi-skilling is expected of team members;
- Pay and incentives are based rather on team than individual performance; and
- Team functioning is influenced by:
- Team task design;
- Team process interventions;
- Organization support systems."

Changes or improvements to business processes have a profound and long lasting effect on all the levels of the organization and specifically on the individual and his or her quality of work life. From an organizational behavior and organizational design perspective process management is unmistakable one of, if not the most important, Critical Core Capability for management to have control over. Process improvement teams and individuals should therefore constantly reflect on the psychological impact of the change on the individual that ultimately impacts the different levels of the organization.

2.8.1.3.1 Business Process Reengineering

Biazzo (1998:1000-1016) argues that BPR "is often undertaken in response to dramatic changes in the external environment, a paradigm shift, for instance, that apply considerable pressure on the ability of the organization to fulfil its mission, improve its competitive positioning, or even survive as an entity." He further states that BPR "actions are radical and transformational. The focus is on the end-to-end process or a considerable subset of that process. Virtually all functions within the organization are affected by BPR actions. The existing organizational and technological infrastructures are subject to major dislocations and pressure is applied to the very culture of the organization."

According to Hammer and Champy (1993:32), BPR is "the fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in critical, contemporary measures of performance, such as cost, quality, service and speed. Assuming that the objective of BPR is to produce quantum leaps in enhanced quality, improved cycle time and cost efficiency, baseline measurements and data will be of little use and may inhibit the search for new, more meaningful measures."

The same authors are of the opinion that BPR actions "should be initiated and guided by senior leadership. Cross-functional teams should be organized and directed under the auspices of a high-level manager. Because mission fulfilment in a changing external environment is the objective, the organization's strategic and business plans are, or should be, the driving force behind BPR actions."

Hammer and Champy (1993:32) further stress the fact that:

- "The focus of technology should shift from its role as support for current processes to enabler of future (reengineered) processes;
- The organization must recreate itself around reengineered processes;
- All process stakeholders (especially process participants) are affected by BPR projects; and
- New performance measures must be developed to reflect these changes."

Reitsma (1999) indicates "that process reengineering is a very structured and deep version of process improvement. Process reengineering dramatically streamlines business processes and clearly and closely aligns them with customers' needs."

2.8.1.3.2 Business Process Redesign

Davenport and Short (1990) define business process redesign as "the next level of improvement after continuous improvement. Business Process Redesign actions are undertaken in a project context with planned or specific improvement objectives. The focus is on streamlining processes by detecting and eliminating non-value-added process time and costs and incorporating best practices in whole or in part. Moderate improvement in quality, with respect to output products and services, is usually one of the objectives of Business Process Redesign. Processes generally remain intact with respect to other related processes, and there is little to moderate impact on existing supporting information systems."

According to Leavitt (2003), "Business Process Redesign is the analysis and design of workflows and processes to achieve performance improvements."

2.8.1.3.3 Continuous Process Improvement

Leavitt (2003) indicates that 'Continuous Process Improvement begins by analyzing the current workflow and evaluating the results or output, then looking for opportunities to make improvements, making those changes and measuring results, indefinitely. This perpetual readjustment process is intended to keep workflows synchronised with changing circumstances and opportunities and always functioning at peak efficiency."

Juran and Godfrey (1998:3.3) point out that "Continuous Process Improvement is most closely associated with the TQM discipline. The traditional approach is to empower self-managed teams to make task-level improvements in quality, cycle time and cost. Improvements are incremental and sustainable. They are creative responses to the constant need to get the job done in changing circumstances. Continuous Process Improvement actions typically are wholly contained within one functional activity, although cross-functional teams can be organized to deal with chronic or pervasive situations."

Phipps (2001) has identified the concept of Continuous Process Improvement as "embedded in TQM. One of the basic tenets of TQM is that of the continuous focus on the customer and the process."

2.8.1.3.4 Total Quality Management

Kreitner and Kinicki (2004:15-16) state that "TQM means that the organization's culture is defined by and supports the constant attainment of customer satisfaction through an integrated system of models, techniques and training. This involves the continuous improvement of organizational processes, resulting in high-quality products and services."

According to Miller and Milakovich (1991), "TQM and its action corollary Continuous Quality Improvement are theory-based models that integrate different departments or functions within a facility and guide process improvement through the evolution of a revised mission statement and strategic vision, problem-solving techniques, teamwork, statistical process controls, quality standards,

and monitoring. TQM is a method of examining all processes within the system, establishing key preference indicators, and continually improving them. All employees should be included, not only because all processes can be improved, but because it is they and they alone who are ultimately empowered to transfer the organization's planned changes into reality."

The above authors further state that "TQM breaks down processes into a series of identifiable customer-supplier transactions in which the objective is to improve the process and meet or exceed expectations of the organization and customer. The key combination for transforming to a TQM organization is a behavioral-cultural change in concert with statistical monitoring capacity. In this manner, the dynamic improvement process can be guided and monitored to reach desired quality levels, to increase efficiency and effectiveness, to reduce costs and to improve overall system productivity."

2.8.1.3.5 Continuous Quality Improvement

Miller and Milakovich (1991) declare that "Continuous Quality Improvement is the action corollary of TQM, and is a theory-based model that integrates different departments or functions within a facility and guides process improvement through the evolution of a revised mission statement and strategic vision, problem-solving techniques, teamwork, statistical process controls, quality standards and monitoring."

2.8.1.3.6 Just-in-Time

Stahl (1999:29) indicates that "in conventional Just-in-Time purchasing, customers and suppliers conduct themselves as partners rather than as adversaries. These partnerships provide long-term contracts to single-source suppliers. In return for the cumulative volume of business, the customer receives frequent deliveries in small quantities of high-quality goods. Benefits reported by Just-in-Time purchasing customers include improved communication between customer and supplier and the reduction of lead times, on-hand inventories, space needed for storage, and paperwork."

Pragman (1996) states that "by definition, system integration seeks ways to improve coordination between various departments or functional areas. The practice of Just-in-Time II links engineering, planning, and purchasing departments and bridges the inter-organization gap between customer and supplier. System integration is achieved because sequential processes are no longer separated by functional or organizational walls." He, however, states that "within relationships with external parties Just-in-Time II is not acceptable to all parties as intimate business knowledge must be traded and there is a reluctance to make certain advantageous information public."

2.8.1.3.7 Six Sigma

Hill and Wilkinson (1995:8-25) state that "Six Sigma is a statistically based philosophy that aims to reduce defects boost productivity, eliminate waste, and cut cost throughout the organization."

Porter and Tanner (2004:5) state that "Six Sigma is not new; it is the successor in all but name of TQM and its origins can be traced to Motorola in the early 1980s. Six Sigma is a disciplined methodology for improving the organization's processes, based on extremely rigorous data gathering and analysis. The approach focuses on helping organizations to produce products and services better, faster and cheaper by improving the capability of processes to meet customer requirements. Six Sigma eliminates costs that add no value to customers."

2.8.1.3.8 ISO 9000

Porter and Tanner (2004:78) state that "ISO 9000 defines a set of internationally accepted standards for business quality that were adopted in 1987 by the International Organization for Standardization (ISO). ISO 9000 is also the quality standard that the European Union subscribes to and the European Unity requires that the quality of a organization's manufacturing processes and products be certified in terms of this standard."

Porter and Tanner (2004:39) further found that "ISO 9000 certification was not shown to have a significant and positive effect on organizational performance in the presence or absence of a business excellent environment. This supports the view that, on average, ISO 9000 certification has little or no explanatory power on organizational performance." The same author's believe that "ISO 9000 could contribute to organizational performance, provided that a climate of change is created."

2.8.1.3.9 Service Level Agreements

Tyler (2004:2) points out that "the main purpose of Service Level Agreements in the case of external parties and partnership agreements with internal parties is for the parties to agree on and to define the minimum service levels between them in support of a predefined scope in terms of specified services or products and more importantly to monitor the conformance of those minimum requirements and build good business relationships between them. The aim of Service Level Agreements is to manage cost and quality and to align the service to the needs of the customer."

According to Pantry and Griffiths (1997:20-29), "a Service Level Agreement can be defined as an agreement between the service provider and its customers quantifying the minimum acceptable service to the customer." The following rules, criteria and scope should guide the agreement between parties:

- "The agreement has to be negotiated and agreed;
- It must be based on accurate utilization and volume forecast;
- Take note of practical difficulties and cost;
- It is a joint exploration of what is in the best interest of the customer's business;
- Quantifying is vital, what cannot be measured does not exist and cannot be managed;
- Various aspects of the service must be quantified; and
- The following minimum service level must be identified:
  - What is the benefit of each level of service?; and
  - What is the cost of each level of service?;
    - At what level is cost justified?;
    - There is no benefit in over-providing quality. It just costs more money; and
    - Don't raise expectations to a level that becomes unsupportable when volumes increase.
- The criteria should include:
  - Availability: Service availability, resource availability;
  - Performance: Speed, response, quality and accuracy; and
  - Security: Privacy and confidentiality.
- The scope must include:
  - Every Service Level Agreement that was established must be monitored constantly;
  - Regular customer feedback must be obtained, analyzed and reacted upon;

- There must be an appropriate infrastructure to support the management and control of Service Level Agreements;
- Service Level Agreements should be introduced via a pilot implementation phase;
- Reporting should be based on actual performance against Service Level Agreement specifications;
- Service review meetings should be held regularly;
- Customer review meetings should be held regularly; and
- Terms of reference, accountabilities and responsibilities of role-players should be specified and monitored."

2.8.1.3.10 Staffing models and capacity planning

According to Botha and Ellis (2004), "Human Resources are seen as the most expensive resource within organizations. The management of the Human Resources or staffing levels is therefore extremely important and should be managed on a day-to-day basis through the utilization of an acceptable scientific derived model or tool." They state that the business rationale for staffing models or capacity planning is:

- "To enable and align business operational activities with changing operating models within business units;
- To set, monitor and adjust productivity and efficiency levels;
- To facilitate improvements and monitor benefits from business changes;
- To be able to review norms and service levels with business change;
- To support business processes by designing correct structures and staffing levels that will enable delivery of services; and
- To be used as a management tool and guidance to line management for the purpose of capacity management of the overall organization capacity requirements from a centralized point."

Niebel and Freivalds (2003:2) point out that "time studies, performance measurement, analysis and conversion of findings into a model constitute the main steps towards capacity planning of the staff complement. Time study is often referred to as work measurement. It involves the technique of establishing an allowed time standard to perform a given task, based on measurement of the work content of the prescribed method, with due allowance for fatigue and for personal and unavoidable delays."

2.8.1.4 Process Improvement Model/Approach

Reitsma (1999) proposes that "process improvement should be done according to an accepted scientific model, based on the methodology or performance enabler utilized to ensure that the improvement initiatives are scientifically sound and acceptable for management." The author points out that "several models are available for organizations to adopt, fine-tune according to their needs and utilize." The approach could include the following basic steps:

- "Document current process workflows;
- Identify improvement opportunities and design new process workflow;
- Add use cases to the new process workflow diagram; and
- Develop an implementation strategy for coordinated process and information system changes."

Juran and Godfrey (1998:6.6) propose the following tools to pursue the control, improvement and optimization of the process to meet customer demand and business needs:

- "Definitions of process requirements;
- Step-by-step process documentation;
- Establishment of process measurements;
- Removal of process defects; and
- Assurance of process optimization."

Most of the improvement models are, to a certain degree, based on the model developed by Dr. W. Edwards Deming and therefore closely linked to the TQM philosophy. The main activities of the models usually include the PDCA cycle, i.e. Plan, Do, Check and Act. See Figure 2.15.

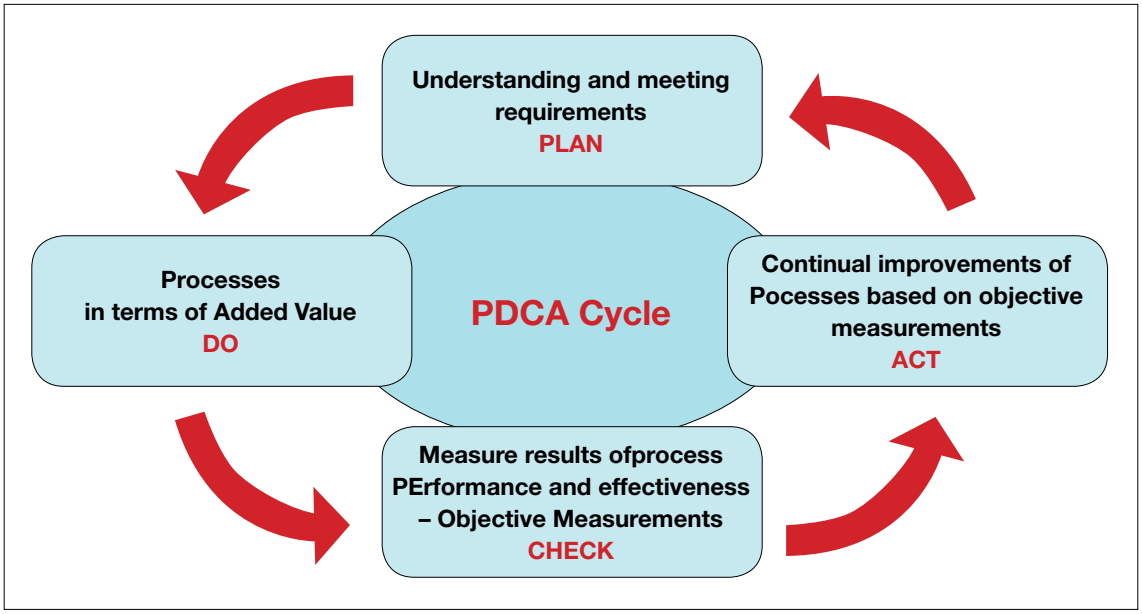

Figure 2.15 Process Approach – Continual Improvements of Process (Kwaliteg, 2005)

Models such as the one below are extremely detailed and cater for continuous process improvement as well as process redesign.

The Centre for Strategic Leadership Studies (1996:4-6) proposes the following model that is based on the PDCA cycle:

"Part 1:	**Process simplification cycle**
Facet 1:	Basic simplification, based on experience, qualitative knowledge of the process and perceptions of the best way to operate. This facet can also to a lesser degree be performed as a Continuous Process Improvement;
Step 1:	"A": Select the process to be improved and "B": establish a well-defined process improvement objective;
Step 2:	Select the team to improve the process;
Step 3:	Map the current ("As-Is") process (Current baseline); and
Step 4:	Simplify the process and remove redundant or unnecessary activities.

Facet 2:	Scientific approach is fully based on Business Process Redesign
Step 5:	Compile data collection and base-line date plan (As-Is);
Step 6:	Redesign/Redevelop Business Processes ("To-Be");
Step 7:	Assess whether process is stable;
Step 8:	Assess whether process is capable;
Step 9:	Identify root causes that prevent the process from meeting the set objective;
Step 10:	Develop a plan for implementing a change based on the possible reasons for the process's inability to meet the set objective;
Step 11:	Modify the data collection plan developed in step 5, if necessary;
Step 12:	Test the changed process and collect data;
Step 13:	Assess whether the changed process is stable;
Step 14:	Assess whether the change improved the process; and
Step 15:	Determine whether additional process improvements are feasible."

Bisson, Folk and Smith (2000:58-63) propose a model that includes steps describing an approach beginning with problem definition and concluding with the hand-off to an implementation phase:

Step 1:	"Create a relationship map;
Step 2:	Select the people to be trained;
Step 3:	Train the project and steering teams;
Step 4:	Select process and project team;
Step 5:	Plan the project;
Step 6:	Create a relationship map specific to the process to be improved;
Step 7:	Build the "As-Is" map;
Step 8:	Identify disconnects;
Step 9:	Decide whether to patch or redesign the process;
Step 10:	Define "To-Be" attributes;
Step 11:	Build the "To-Be" map;
Step 12:	Specify measures;
Step 13:	Critique and revise proposed designs;
Step 14:	Formulate recommendations; and
Step 15:	Decide whether or not to implement recommendations."

2.8.1.5 Analysis Techniques

The Centre for Strategic Leadership Studies (1996: Modules 1-11) proposes various analysis techniques that Analysts can utilize to analyze a process. Some of these analysis techniques also serves as measurement techniques and will be discussed as such later in the document, e.g. observation and interviewing, performance analysis, conformance to standards, fitness for purpose, process time and process cost.

2.8.1.5.1 Observation and Interviewing

According to The Centre for Strategic Leadership Studies (1996: Modules 1-11) "the analyst should have proposed an initial definition of the problem and specified the purpose of the analysis before the observation and interview process begins. The different viewpoints from which the problem is to be analyzed should be documented. The problem definition, purpose, and viewpoints should be reviewed and validated with the sponsors of the analysis."

"Note that activity analysis is an interactive process. The initial problem definition, purpose and viewpoints are useful in organizing the activity analysis but may be modified based on new information."

"The benefit of observation and interviewing is that the analyst gains firsthand knowledge about day-to-day operations and is able to provide a basis for question formulation and problem verification."

"The risk in too much observation is that it could lead to identifying too closely with the way things are currently done. This subjectivity can inhibit the identification of alternate ways to describe and accomplish system activities."

2.8.1.5.2 Performance Analysis

According to The Centre for Strategic Leadership Studies (1996: Modules 1-11) "Another activity analysis type that may be used to define and bound activities is performance analysis. Measures of performance, i.e. cost, time and quality, can help an organization to set its priorities for detailed activity analysis."

"Cost analysis allocates budgets by cost element across the activities performed in the organization. Cost analysis reveals the high cost-drivers within the organization and reveals where the most significant impact can be made."

"In many instances, certain activities within the business do not appear to be cost-drivers and are not labor-intensive, but may impact the ability of the business to operate."

"Timeline analysis allows the analyst to locate the bottlenecks within a system. A function may not take a lot of time or contribute significantly to lead time, but it may consistently generate poor quality output, which indirectly undermines the effectiveness of the organization. Quality analysis determines which activities have the greatest bearing on overall product quality."

2.8.1.6 Process Improvement Techniques

The Centre for Strategic Leadership Studies (1996: Modules 1-11) introduces various process improvement techniques also referred to as problem-solving methods that exist that Analysts can utilize to improve a process, such as:

"Strategic Techniques

- Brainstorming;
- Nominal Group Technique (NGT);
- Performance cell technique; and
- Strategic benchmarking.

Tactical Techniques

- Activity modelling;
- Data modelling;
- Activity-Based Costing (ABC);
- Pareto analysis;
- Histograms;
- Best practices benchmarking;
- Simulation;
- Force field analysis;
- Economic analysis;
- Program Decision Process Chart (risk analysis); and
- PERT/Gantt Charts.

Operational Techniques

- Check sheets;
- Control Sheets (Run Chart); and
- Cause and Effect analysis (Fishbone diagram – Kaoru Ishikawa)."

2.8.1.7 Project Management Principles

According to Baguley (1999:10), "a project is a process or a mechanism that enables an organization to focus resources and abilities towards a desired outcome and thus enabling an organization to respond quickly to customer requirements."

Kerzner (1997:2) argues that "there are only two ways in which work gets done in organizations: through business processes or through projects. Business processes are permanent work structures that transform inputs continuously into outputs as ongoing operations. Projects on the other hand are temporary work structures that shut down once the output has been achieved."

The above author also states that "the nature of most process improvement initiatives - not continuous improvement - are once-off temporary initiatives and are executed according to proper Project Management principles. This requires that process analysts must be skilled in Project Management principles or that proper project managers must be assigned to manage the project. This further entails that, with every initiative, the following phases will be executed to some degree: Initiation/ Concept, Development, Implementation and Termination."

2.8.1.8 Risk Management

Due to the changes posed within every process improvement initiative the organization, project and process are at risk. Risks must therefore be identified and managed within the project according to Project Management principles.

Dobbins (2002) states that "most people are familiar with typical risk management processes, i.e. risks are identified and their probability of occurrence and consequence of occurrence assessed. A risk management plan is then designed and established to eliminate or alleviate the impact of the serious risk events. Every risk is necessarily a future event, and only when the risk event actually happens is the risk transformed into a problem. The better teams are at identifying risks and understanding the underlying basis of risks, the better they can manage the risks. The objective is to eliminate as many as possible of the serious risks."

Al-Mashari and Zairi (1999) indicate that "BPR implementations involve radical change to several systems in the organization. Therefore, continuous risk assessment is needed throughout the implementation process. It is ideal to deal with any risk at its initial state to ensure the success of the reengineering efforts." They note that "anticipating and planning for risk handling are important for dealing effectively with any risk when it first occurs."

2.8.2 Critical Success Factors specific to: Process Improvement

Continuous Process Improvement is the backbone of competitiveness and therefore critical to any organization. The inability of organizations to succeed at sustainable process improvement underpins the identification of those Critical Success Factors that will enable sustainable improvement if management can maintain control over them. From the literature the following were identified as Critical Success Factors to be included in the BPMCAM:

- The improvement of processes must be continuous and must be a joint undertaking between the process efficiency department, the process owner, the business units performing the process, and all other stakeholders;
- Business process improvement must focus on overall process performance and must provide the process foundation for customer service;
- Managers must focus on improving an entire set of activities within processes and sub-processes;
- Management attention must be focused on execution and sustainability of improvement programs;
- Business process improvement must include top-down and bottom-up process modelling right across the value chain, involving all business process participants: systems, people, information, and machines;
- All stakeholders must continuously focus on identification of process improvement opportunities;
- The organization must utilize different process improvement methodologies, such as Business Process Redesign, Continuous Improvement, TQM and Six Sigma. Stakeholders must be trained in the utilization of said methodologies;
- The organization must follow approved and tested improvement models/approaches, supported by recognized process analysis and improvement techniques to ensure scientific process improvement solutions;

- Process improvement initiatives must be performed according to Project Management principles to ensure a focus of resources and abilities towards the desired outcome; and
- The management of risk must form an integral part of all improvement initiatives.

2.9 PROCESS REVIEW CYCLE

With the impact that changes in the political, economical, social, technological, environmental, and regulatory environments have on organizations today, the organization's business processes must be under constant review as organizations can no longer wait until the process no longer works or conforms. They must be proactive in order to remain competitive and to comply with regulatory requirements.

Reviews of processes are two-fold, e.g. during the process improvement or development cycle as well as during the operational phase.

2.9.1 Review during Process Improvement or Development Cycle

Smith and Fingar (2003:90) are of the opinion that "the processes review cycle forms part of the analysis phase of their Process Life Cycle model (See figure 2.16). During the process improvement project the Analyst will distribute the process map in progress to other team members (subject matter experts, management, reviewers, commentators) for comments. These individuals must receive the process map with all the relevant documents and text in order to perform an in-depth review of the proposed "To-Be" process. The subject matter experts must review the process in context of all its supporting documentation against the stated process and sub-process goals and must comment comprehensively in writing to the Analyst."

The above authors are of the opinion that "the analyst must respond to each note in writing in order to ensure that every comment has been properly assessed and verified." They strongly propose that "this method of reviewing should continue until after the process has been finalized, accepted and signed-off by the process owner." It is essential to the authors that "all the documents, i.e. diagrams, text, glossaries, decision summaries and background information, that were created during the improvement or development cycle will become part of the process kit that will be secured in order for improvement teams to use such documents again during later review stages."

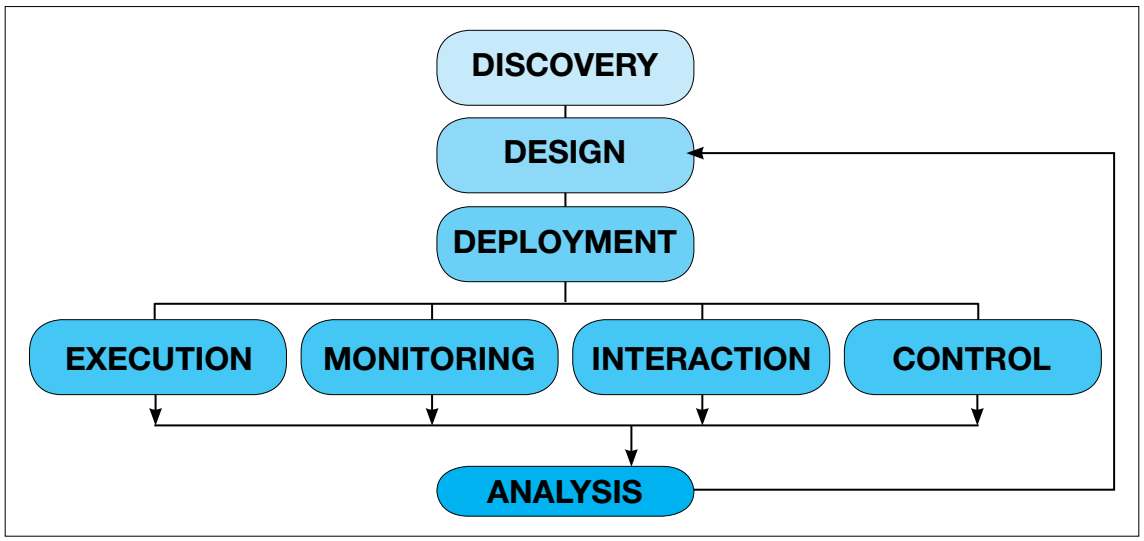

Figure 2.16 Process Life Cycle Discovery (Smith and Fingar, 2003)

The same authors propose the following definitions for the steps or stages of their Process Life Cycle Discovery model:

- "Discovery: Know exactly what is done – "As-Is" baseline;
- Design: Modelling, manipulating and redesign;
- Deployment: Roll-out of new process to all stakeholders and role-players;
- Execution: The utilization of the new process by the participants – people, computer system, other organizations and other processes;
- Monitoring and control: Applies to both process and Business Process Management system. Activities focus on the business and technical interventions needed to maintain the health of individual processes, classes of processes and the entire environment. This covers technical performance of process, allocation of process between partners and owner, as well as changing and improving process on a daily basis as needed;
- Interaction: Means the ongoing activity of process improvement, closing the gap between process design and the analysis of feedback from actual process performance. Optimization relies heavily on process analysis; and
- Analysis: Means measuring process performance to provide the metrics, analysis and business intelligence needed to drive improvement strategies and discover opportunities for innovation. It provides a wide-angle view of end-to-end process. Analysis plays a major role in the review cycle to determine "What-If" scenarios."

2.9.2 Review during the Operational Cycle

Smith and Fingar (2003:90) are of the opinion that "process review during the operational cycle of a process is suppose to be a constant action that takes place during the execution, monitoring, interaction, control and analysis steps within the Process Life Cycle Discovery model" (Figure 2.16). They base their theory on the fact that "the identification of review opportunities during the operational cycle of a business process can stem from factors that originate during any of the stated phases."

Smith and Fingar (2003:90) further propose that the following operational factors can give way to the necessity for a process to be reviewed:

- "Excessive waste of material;
- Excessive rework or returned items;
- Unproductive units or equipment;
- Constant request for more staff;
- Work not finalized on time;
- Excessive overtime worked;
- Work not finalized according to specific quality;
- Major customer dissatisfaction;
- Dissatisfaction between units;
- Bottle necks;
- There is a visible gap between actual and desired process results; and
- Problem occurs frequently."

They also argue that the following "other" internal factors can give rise to the necessity of a process to be reviewed:

- "Proposed changes to products;
- Proposed changes to systems that support processes; and
- Changes to corporate policy or strategy that impact processes."

The same authors also identify external factors as reasons for reviewing of processes, such as:

- "Changes in legislation; and
- Industry changes."

2.9.3 Critical Success Factors specific to: Process Review Cycle

One of the major reasons why processes are only fixed when they "break" is the absence of a proper review policy within organizations and the inability of management to identify lapses in process performance without a proper measurement and review process. The following areas are identified as being critical areas for management to have control over to ensure the timely review of the organization's processes:

- The organization must have a review program which has to systematically cause significant process improvement;
- The organization must manage the life cycle of improvement and optimization and not leave it to chance;
- The workforce must have the "big picture" regarding review of enterprise-wide core processes and not review processes in isolation;
- There must be an integrated work plan that enforces the review of proposed processes by stakeholders during the improvement phase;
- All resources must be involved in the implementation of processes and must be properly coached in the specific tools to be utilized in the review process such as change management and culture change models;
- The implementation stage must be followed by a post-implementation assessment phase that should provide sufficient feedback on all aspects to management; and
- Processes must be implemented and managed to ensure that continuous improvement and review of processes will be sustained during the operational phase of the process that follows the initial reengineering or redesign project.

2.10 STANDARDS AND MEASUREMENT

> *"Measurement is the first step that leads to control and eventually to improvement. If you can't measure something, you can't understand it. If you can't understand it, you can't control it. If you can't control it, you can't improve it."* – H. James Harrington

Kaydos (1998:2) indicates that "performance measures are probably the best way to communicate an organization's strategy throughout an organization. This of course means an organization must develop a strategy and determine what each operating unit must accomplish to execute it. This further requires establishing an organization's strategic objectives and then breaking them down into lower level objectives and corresponding performance measures." He is of the opinion that, "unless an organization's key business processes are controlled and meet the defined performance objectives, there is no way to tell whether a strategy is effective or not."

The above author is further of the opinion that "a good performance measurement system must reflect what is important to all of its stakeholders, i.e. the organization, its customers, its employees, and arguably government and society as a whole."

2.10.1 Standards

According to Johnson (1993:32-33), "standards are based on established objectives and provide a yardstick for performance measurement. Standards can be utilized for soft measurement areas such as customer satisfaction, conformance to rules, regulations and policies, as well as efficient utilization of resources. Standards can also measure hard subjects such as productivity, quality, on-time delivery and various costs."

Kaydos (1998:16) indicates that "when the reference for comparison is based on an internationally recognized standard, such as grams, metres, seconds or volts, the measure should be referred to as standardized. Where no acceptable standard exist, the measure will be called a relative measure. A relative measure can be compared to itself at some other point in time or to the same measure in another system. When using something other than a recognized standard as a basis for measurement, care must be taken that all comparisons are valid."

2.10.2 Measurement

Kaydos (1998:15-21) argues that "the measurement of the appropriate process variables is not the only requirement for a performance measurement system that will facilitate performance improvement." He is of the opinion that "there are additional technical and cultural requirements which must be satisfied for performance measures to provide managers with accurate, relevant, and timely information, i.e. wholeness of all the variables, explanation of the performance gap, sufficient details, accuracy, timelines and frequency."

Johnson (1993:31-35) states that "measurements should include both the maturity of governance of Business Process Management, as well as the measurement of the optimized state of all business processes in the organization."

"Measurements are taken to determine the actual performance that had occurred by comparing the results against the standard."

Wheelen and Hunger (1986:A90-A94) focus on the problem of short-term visioning within the measurement environment when they state that "goal displacement and short-run orientation are likely side-effects of evaluation and control because no system can be all-inclusive. Goal misplacement occurs because people find it easier to focus on a surrogate of performance (the measure) than the performance itself, e.g. reaching a sales target and not the total quality of the sales process. The measures by themselves do not cause short-term orientation. The time frames in which they are used cause the result, for example in cases where managers want faster results and therefore also reward short-term performance easier. This situation stems from the problem that most managers are not concerned for the long run."

Hunt (1996:46) argues that "business enterprises often make the mistake to think that they can start reengineering before developing performance measurement systems." His belief is that "this

approach can be detrimental as it leaves the organization without the means to compare the old processes' baseline measures to the new reengineered process performance."

MacArthur (2004) is of the opinion that "process measures enable an organization to control and improve its operational performance. Determining process and sub-process performance measures requires understanding what a process is supposed to accomplish and how it works."

He states that from a measurement perspective the measurement of processes gives a clear indication on:

- "Customer satisfaction;
- Cycle time;
- Cost of quality, i.e. rework, redundancy, reconciliation and defects;
- Decision-making;
- Human resource utilization;
- Cost; and
- Information effectiveness."

Juran and Godfrey (1998:6.6) advocate that "performance measurement models are needed to monitor progress towards attaining the system's goals and objectives." They propose the following three principal dimensions for measuring process quality:

- "Effectiveness is achieved when the process meets customer needs;
- Efficiency is achieved when the process is effective at the least cost; and
- Adaptability is achieved when the process remains effective and efficient in the face of the many changes that occur over time."

2.10.2.1 Measurement Techniques

According to Melnyk and Denzler (1996:309-311), "process management works best in terms of objectives, goals and strategies within the context of an enterprise - its unique organization and technology. Process management relies on feedback to evaluate and improve process performance. Further, to establish meaningful measures is a primary consideration."

"There are four all-inclusive categories of performance measures. Specific measures within these categories provide the basis for evaluating both the satisfaction of stakeholder interests and the performance of all process participants. Measurement includes measurement of the organization through techniques such as Balanced Scorecard and benchmarking, as well as the four categories of performance measures, i.e. conformance to standards, fitness for purpose (effectiveness measures), process cycle time, and process costs (efficiency measures). Other important measurement criteria are customers and suppliers."

2.10.2.1.1 Balanced Scorecard

Porter and Tanner (2004:5) indicate that the Balanced Scorecard "is in essence a measurement system that enables the effective translation of strategy into action by developing an understanding of the cause and effect relationships that deliver the strategic outcomes. It attempts to link the "people" dimension of learning and growth to the process issues of quality and time, then to the customer dimensions of delivery and loyalty and, finally, to financial outcomes such as return on capital employed."

2.10.2.1.2 Benchmarking

The Oxford Advanced Learner's Dictionary (2003:95) states that benchmark refers to "something that can be measured and used as a standard that other things can be compared with."

Keydos (1998:15-21) is of the opinion that "the most valuable comparison for an organization would be comparing its key performance factors to its competitors and to benchmark that they are truly best in class or best in industry."

2.10.2.1.3 Conformance to standards

Melan (1992:67) states that "conformance to standards measures are concerned with product and process quality with respect to a norm. Conformance to standards measures the factors of customer acceptance of a product, service, or deliverable, number of rejects, adherence to procedures, test results, budget performance, compliance with public law, statutes, and regulations, and issues associated with health, safety, and security."

In the same author's opinion, "there must be a well-documented or illustrated standard in place. The standard must state the requirements, the authority for the standard, and the applicability. New standards of performance should be validated before being put into service for a given process. Benchmarking is a particularly good technique to use in establishing standards of performance in this category."

"While all four process stakeholders (customers, suppliers, higher authority and resource providers) are concerned with conformance to standards, higher authority is particularly interested because it is the source for most conformance standards. Customers are also interested in conformance to standards as it applies to output products and services."

2.10.2.1.4 Fitness for purpose

To Melnyk and Denzler (1996:309), "fitness for purpose (use) measures are focused on the degree to which a given interaction between a stakeholder and the process meets requirements or satisfies an objective. Fitness for purpose measures such factors as how well a product or service satisfies, (meets requirements) or even excites (exceeds requirements) customers. Customization, flexibility, and responsiveness are qualities that generate fitness for purpose measures."

"Fitness for purpose also applies to other stakeholders. Higher authorities need to measure the relevance of standards, rules, and regulations to the processes on which they are imposed. Suppliers are becoming more proactive in supplying processes with just enough value-added materials and data to meet process requirements with a minimum of waste. Resource providers are concerned with providing suitable facilities, equipment and funding vehicles to maximize process performance."

2.10.2.1.5 Process time measures

Melan's (1992:67-68) process time measures "are concerned with process cycle time, throughput and responsiveness. But process time is also a reliable surrogate measure for process cost because process costs are consumed over time and, in general, the less time a process takes to complete a cycle or produce a product, the lower the cost. Many leading organizations focus on reducing process time rather than on reducing process cost. As a result, they improve cycle time while automatically reducing process cost."

"Process time measures fall into three subcategories. Operations time is defined as the time spent within a process transforming inputs into outputs by adding value to the inputs. It is the direct application of resources or factors of production in making the transformation. Non-value-added time is time spent in the process other than operations time or quality-related time. It includes delay or wait time, meetings and report writing, supervision and oversight, compliance with unnecessary or inappropriate regulations, planning and budgeting, employee relations, acquisition and procurement and internal paperwork. Quality-related time includes inspection, rework, error prevention, problem determination, problem solving, quality-related maintenance and training."

2.10.2.1.6 Process costs

Melnyk and Denzler (1996:204-205; 398-399; 574) describe process cost measures "as being concerned with the consumption of resources allocated to the process of producing output products and services. Variable costs include supplies that are used up in producing outputs as well as the factors of production, which include labor, machine hours and facilities integral to process operations."

They state that "there are also fixed process costs not directly associated with process operation that must be measured, managed, and controlled directly. These include cost of excessive benefits and perquisites, cost of facilities not directly related to work processes, and cost of non-productive (non-income-producing) assets."

2.10.2.1.7 Customer satisfaction

Cheales (1994:2-3) is of the opinion that "such business tangibles as cash flows, overheads, production costs and turnover are relatively easy to measure. But measuring an intangible aspect like customer satisfaction requires a different mindset and a different set of parameters. The main problem of measuring an organization's level of customer satisfaction is not knowing what to measure. Measuring the wrong parameters is as bad as not measuring at all."

He states that, "according to researchers at Texas A&M University, customers evaluate the quality of the service that organizations provide according to the following five factors:

- Reliability: The organization's ability to provide what was promised, dependably, accurately and on time;
- Responsiveness: The organization's willingness to help customers promptly;
- Assurance: The knowledge and courtesy the organization show to customers and their ability to convey trust, competence and confidence;
- Empathy: The degree of caring and individual attention the organization show their customers; and
- Tangibles: The organization's physical facilities and equipment, and the appearance of the organization and the organization's staff."

He also is of the opinion that "the organization cannot improve on the quality of service that customers are offered until the organization knows what customers like and dislike about their service. The organization can only obtain that information by asking them how the organization is doing and how the organization can do it better."

Cheales (1994:2-3) offers five effective techniques to measure customer satisfaction:

- "Make measurement visible;
- Make it easy for customers to complain;
- Establish performance targets;
- Involve the customer in the measurement process; and
- Measure frequently."

2.10.2.1.8 Supplier relationships

Melnyk and Denzler (1996:620-622) claim that "suppliers form an integral part of the supply chain and the management of the supply chain. Suppliers are willing to contribute in various ways to organizations if they feel secure in the partnership and are seen as part of the organization's supply value chain, such as:

- Lower costs;
- Improved flexibility;
- Higher quality;
- Increased market perception of higher quality;
- Easier availability of excess capacity;
- Newer technology; and
- Broader access to technical expertise, etcetera."

They state that "if the organization changes processes that impact the supplier, without involving the supplier in the decision, it will hamper the supplier to fulfil his responsibilities to the organization. In certain industries suppliers are extremely limited and organizations compete for those services or goods, supplier power is therefore extremely high and the organization should continuously measure supplier satisfaction to ensure a durable relationship."

2.10.2.1.9 Reaching process goal

Melnyk and Denzler (1996:318) state that "a process is tested against its ability to reach or exceed process goals. Goals guide performance measurement and evaluation and they keep quality in its necessary place. If process goals are correctly determined, it implies that reaching these goals will constitute an optimized process regarding cost, quality and time."

2.10.2.1.10 Quality

Melnyk and Denzler (1996:103) define quality "as how well a product meets customers' expectations. Quality has different attributes, i.e. functionality, reliability, durability, safety, serviceability, aesthetics, and perceived quality."

They indicate that "within the TQM environment, product quality is the ultimate goal and measurement and that there are five different views of quality:

- Transcendental view: A condition of excellence defining fine quality as distinct from poor quality;
- Product-based view: Differences in quality amount to differences in the quantity of some desired ingredient or attribute;
- User-based view: Capacity to satisfy wants;
- Manufacturing-based view: Conformance to requirements; and

- Value-based view: The degree of excellence at an acceptable price and the control of variability at an acceptable cost."

2.10.2.2 Responsibility for Measurement and Control

Melnyk and Denzler (1996:298-308) are of the opinion that "although the ultimate responsibility for measurement and control of business processes lies with the process owner, it is every stakeholder's responsibility to ensure that the process conforms to standards." They further state that "within the total quality environment, both Juran and Deming advocated the importance of management in the successful implementation of quality in an organization. To make quality a strategic issue, managers must measure it. They must continuously assess the cost of failing to achieve quality goals in monetary value."

2.10.2.3 Critical Success Factors applying to: Standards and Measures

The proof of successful process improvement lies within the ability of the process to perform better than before with regard to cost, quality and time. The only way this can be proved is to measure key performance areas against either the set standards or against best in class organizations or processes. It is therefore extremely important for an organization to know what and how to measure. The following areas were identified as critical areas for management to have control over in the measurement of performance:

- Performance standards and compliance principles must be determined and included in all business processes during all appropriate stages of the business process;
- The performance standards as well as the responsibility of every stakeholder regarding the said standards of all critical business processes must be well communicated and clearly understood by all stakeholders;
- Measurements of process performance must involve all stakeholders and must be done on the end-to-end total quality of the process and must include financial, operational, customer, supplier and organizational criteria;
- Measurement techniques must ensure alignment with enterprise-wide goals, and must be integrated with the organization's measurement tools such as the Balanced Scorecard;
- Through the "As-Is" process, areas must be identified where measurement should be performed via service level agreements with external suppliers/clients and partnership agreements with internal suppliers/clients; and
- All layers of management must consistently promote a positive quality culture.

2.11 ASSESSMENT MODELS

The Oxford Advanced Learner's Dictionary (2003:57; 755; 1262) defines Assess, Assessment, Model, and Tool as follows:

Assess: "To make a judgment about the nature or quality of …"

Assessment: "An opinion or a judgement about something that has been thought about very carefully …"

Model: (1) "A simple description of a system, used for explaining how certain things work or calculating what might happen … (2) To create a copy of an activity, a situation, etcetera so that you can study it before dealing with the real thing."

Tool: "An instrument that helps you to do your job or to achieve …"

For the purpose of this study, an assessment model will be defined as an instrument or model that has been designed to assess the status of the Business Process Management functionality, in order to make an informed judgement on whether an organization or a unit has the correct functionalities in place to achieve and maintain a mature status of Business Process Management.

Management continuously seeks ways or methodologies to measure or assess numerous functionalities or core capabilities of the organization or individual units. Measurement models or tools should therefore be valid and reliable. Organizations can assess their performance or excellence via the utilization of an external assessor or can, on a more continuous basis, perform self-assessment by means of an accepted model. Various models exist of which the excellence models that are closely related to TQM are the best-known models.

2.11.1 Excellence Models

Porter and Tanner (2004:3-7) have investigated the assessment of business excellence comprehensively and state that "the assessment of business excellence or organizational excellence is an essential part of the learning and measurement process. This process involves people that are participating in self-assessment and allows organizations to identify strengths and improvement opportunities as well as enabling the progress of excellent programs to be monitored in a systematic way." The same authors define self-assessment as "a comprehensive, systematic, and regular review of an organization's activities and results referenced against an appropriate business excellence model. These types of business or organizational assessments are some of the most powerful organizational learning tools available."

They comment that "whilst most excellent approaches could trace their roots back to TQM, the excellence concept as described in most excellence models is more holistic in nature than the earlier models of TQM. In particular business excellence or organizational excellence provides for a complete integration of the improvement activity into the organization."

The South African Excellence Foundation (1998:17-36) states that "the core themes of business excellence or organizational excellence as embedded in the South African Excellence Model are divided into enablers and results:"

"Enablers include:

- Leadership: How the behavior and actions of the executive team and all other leaders inspire, support and promote a culture of business excellence;
- Policy and strategy: How the organization formulates, deploys, reviews and turns policy and strategy into plans and actions;
- Customer and market focus: How the organization determines needs, requirements, and expectations; enhances relationships and determines satisfaction of customers and markets;
- People Management: How organizations identify, plan and realize the full potential of all the people who work in the organization;
- Resources and information management: How the organization manages and uses resources and information effectively and efficiently; and
- Processes: How the organization identifies, manages, reviews and improves its processes."

"Results include:

- Impact on society: What the organization is achieving in satisfying the needs and the expectations of the local, national and international community at large (as appropriate);
- Customer satisfaction: What the organization is achieving in relation to the satisfaction of its external customers;
- People satisfaction: What the organization is achieving in relation to the satisfaction of its people;
- Supplier and partnership performance: What the organization is achieving in relation to the management of supplier and partnering processes; and
- Business results: What the organization is achieving in relation to its planned business objectives and in satisfying the needs and expectations of everyone with a financial interest or other stake in the organization."

Porter and Tanner (2004:8) acknowledge that "there is a clear commonality between all the excellence frameworks." They further state that "the award frameworks are seen as best-practice models for the implementing of excellence strategies, performing self-assessment, benchmarking, and ultimately delivering improved performance."

2.11.2 Self-assessment

The purpose of this thesis is to develop an assessment model that can be utilized as a self-assessment model by organizations. It is therefore important to include a full review of the self-assessment process of one of the most prestigious and accepted assessment and self-assessment models in the world, i.e. the Excellence Frameworks.

Porter and Tanner (2004:4-9) refer to self-assessment as "an organizational health check, based on a comprehensive internal assessment of organizational activities and their performance and stakeholder perception. It explains what an organization does and what it achieves. Self-assessment is not only a means of measuring continuous improvement; it also provides an excellent opportunity for integrating business or organizational excellence into normal business activity."

"Self-assessment is conducted to measure improvement progress and potential. Each of the award criteria provides a framework of standardized items against which an organization can measure its performance. This standardization allows comparative analysis and benchmarking, as well as best-in-class performance."

2.11.2.1 Self-assessment Process

According to Porter and Tanner (2004:9), all self-assessment processes (See figure 2.17) "involve collecting data and information about the organization and this data is then subject to the actual assessment process itself."

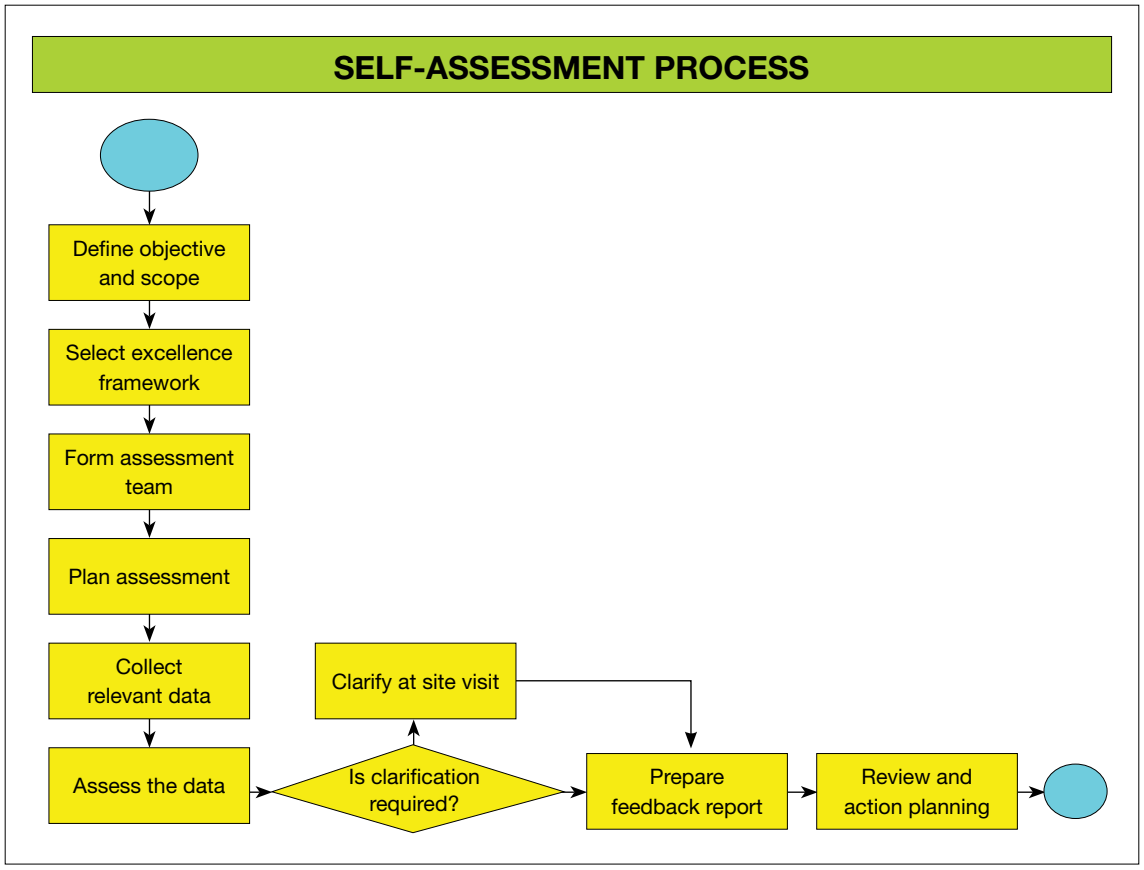

Figure 2.17 Self-assessment Model (Porter and Tanner, 2004)

Porter and Tanner (2004:287-315) include the following steps in their self-assessment process as set out and discussed below.

Define objectives and scope

"A clear purpose for the assessment and well-defined objectives need to be established right at the start of the process. A minority of organizations use self-assessment for winning an award, but most organizations use self-assessment as an organizational improvement tool. The results can be used at any level in the organization. The scope of the self-assessment addresses the question of whether the assessment should cover the whole organization, a division, a business unit or a functional department."

Select framework

"The framework should suit the organization. Issues such as experience in self-assessment, geographical location and the size of the organization will dictate the choice of framework. All award frameworks are, to an extent, purely based on expert opinion and have not been subjected to the rigorous empirical tests that are frequently used in the management sciences. Perhaps organizations should develop their own hybrid models, taking the "best of the best". In summary there is no "best" framework only an appropriate framework."

Form assessment team

"Self-assessment is a team-based activity. No single person is likely to have the in-depth knowledge

of all areas of the framework. The assessment relies on objectivity, and people's perception of excellence differs. In addition, the team-based approach makes the whole process robust to those differing views and experiences."

"The assessment team and the team leader must have credibility to ensure buy-in to the self-assessment results. The assessment team should be trained thoroughly in the self-assessment process. The team members should have an eye for detail, see the context of evidence presented, have a good knowledge of the excellence model, and be committed to the excellence process. A senior assessor should assist the team through all the stages."

Plan assessment

"The planning stage addresses the issue of how the actual data and information will be collected, i.e. in a team, or incumbents of a unit, as well as how the assessment of this data will take place. The assessment roll-out plan, as well as resources needed per unit, must be finalized at this stage."

Collect relevant data

"Self-assessment is an organizational health check that is best based on fact and not on opinion. The data collection phase is governed by two factors, namely the objective required and the resources available. Generally speaking, more resources ensure greater objectivity. The data should ensure that assessors could match what is done and achieved with what the criteria are asking for."

"The information required will be largely determined by the selected self-assessment approach. The following questions could be posed:

- What do you currently do in this area?
- How do you do it?
- What results are you trying to achieve?
- How widely are these practices used?
- Were new approaches developed in a systematic way?
- How has your approach been reviewed and what improvements are undertaken following the review? and
- How is your approach integrated into normal business operations?"

"An area or organization has to demonstrate the following to achieve a seventy-five percent score in an item or enabler criterion:

- Clear evidence of an effective systematic approach with a clear rationale; a well-defined and developed process that focuses on organizational and stakeholder needs;
- Clear evidence of good integration with the organizational needs, strategy and plans, and with other relevant approaches;
- No significant gaps in deployment; structured and systematic deployment to approximately seventy-five percent of potential in all relevant areas and activities; and
- Clear evidence of regular fact-based assessment of the effectiveness of the approach and deployment, and clear evidence of refinement and improvement as a result of organizational learning."

"Similarly, against each of the result items or criteria, explanation should be sought regarding:
- The measure used to monitor performance;
- The extent to which the measures cover the range of the organization's activities;
- The relevant importance of the measures presented;
- The organization's actual performance and performance against target; and
- Comparisons of performance with external organizations, such as competitors and 'best in class' organizations."

"The advantage of this approach is that it should encourage the maximum amount of information to be collected in a structured way."

"Result data should be presented as trend data where possible and comparisons with own targets and external benchmarks are important. To achieve a seventy-five percent score in a result item, an organization has to:
- Demonstrate that current performance is good to excellent in key areas; most results have strong positive trends or sustained excellent performance over at least three years;
- Show favourable comparisons with its own targets in most areas;
- Show favourable comparisons with external organizations in many areas;
- Demonstrate that most of the results are caused by the approach taken; and
- Demonstrate that the scope of the results addresses key stakeholder requirements, most relevant areas and activities."

"In collating the best possible "picture" of the organization, data collection includes:
- Use of documented procedures, for example in the quality or business management system;
- Referral to internal documentation, such as management reports, scorecards, etcetera;
- Surveys;
- In-depth interviews using structured or semi-structured interview pro formas;
- Discussion groups or focus group sessions;
- Use of existing results, reformatting where necessary to suit the specific sub-criteria; and
- Site visits to verify or clarify a specific approach, deployment or result."

Assess and score data

"The assessment phase involves a combination of individual and team assessment of the data and information against the chosen framework. The process is facilitated by the involvement of experienced assessors. It starts off with the individual assessment and ends with team consensus. Factors that can contribute towards assessor-to-assessor variations:
- Individual assessors' business background;
- Individuals' ability to process large amounts of information;
- Differing interpretations of items and sub-items;
- The assessors' approach to processing the information;
- Differing perceptions of excellence;
- The critical approach taken to evidence presented; and
- Different cultural backgrounds."

"Scoring is frequently debated as being subjective and most scoring systems only evolve over years. Organizations may wish to tailor their scoring system to their specific needs or use a simplified system. When considering a two-factor scoring system the obvious anomalies could occur with a poor approach widely deployed or a good approach that has only been partly deployed. For example, a poor approach deployed across the whole organization would average out at sixty percent. Clearly this is not a sensible score because subjectivity now enters into the process by deciding how far this overall score should be moved down. Does fifty percent, forty percent, thirty percent, etcetera, feel right? Part of the problem lies in the process of calculating an arithmetical average. A geometric average (the square root of the product of the two scores) gives a better scoring system, and removes some of the anomalies of the percent system. The geometric mean takes more account of the poor approach."

"This process is finalized with a consensus process:

- Prepare for consensus;
- Review all sub-criteria;
- Agree strengths, areas for improvement and site-visit issues;
- Assessor scores variation;
- If variation <25% points - receive average score;
- If variation >25% points – rescore;
- Another assessor can then score where the variation remains a problem; and
- The senior assessor takes the best view and finalizes the scorebook."

"During the assessment phase many areas requiring clarification will be identified – these need to be done via site-visits where clarification of all uncertainties with the appropriate people is the main objective of the team. As a result the time-lapse between the initial gathering of data and the assessment might result in new information becoming available. It must be clear to the team what new information can be accepted and what not. The rule here is that no new initiative that started after the initial visits can be included, but data on ongoing initiatives and initiatives mentioned during the first visit can be accepted."

Prepare the feedback report

"The feedback report is the final analysis of the organization and major output from the assessment process and contains the accumulated knowledge acquired by the assessor team. The feedback report should be tactful and constructive, and based on the facts presented for the assessment – not opinions. The wording of the report should be non-prescriptive and avoid recommending specific solutions. The feedback report is an opportunity to present a balanced view of the organization, dwelling on both positive aspects and improvement opportunities, and position the organization relative to the most successful exponent of excellence."

Review and action plan

"Any self-assessment cycle should be concluded with a post-completion review to identify what went well with the process, what could be improved, and what benefits have been or are likely to be achieved. It is important to action the results from the report. A rigorous prioritization technique is essential. It is advisable to encourage the management team to take ownership of specific criteria. They are then responsible to take the output per criterion and develop a set of action plans that will cascade improvement activities down through the organization."

"The assessment should be timed to coincide with the business planning cycle in order to ensure that the assessment result is one of the inputs to business planning and doesn't become another level of fire fighting."

2.11.2.1.1 Reasons for self-assessment

As a result of their research, Porter and Tanner (2004:35) have established that "the primary motive for initial and continuous self-assessment is to drive improvement and not to gain external recognition in the form of an award."

2.11.2.1.2 Approaches to self-assessment

Porter and Tanner (2004:318-345) indicate that the main approaches to self-assessment are:

- "Questionnaire and survey approaches;
- The matrix approach;
- The workshop approach;
- The pro forma approach;
- Award-type approach;
- E-approach; and
- Hybrid approaches."

They assessed that in all the approaches the following steps are used:

- "Planning: Full planning cycle of the total project;
- Briefing: One-day session for the whole team;
- Data collection: Usually small team in unit to do this;
- Data analysis: Individual workbooks are assessed by the assessors;
- Action: Develop action plan to address identified improvement opportunities; and
- Review: Assessing the outcome of the process against original objectives and taking on board any learning points that will improve the process in the future."

Questionnaire approach

"The questionnaire approach uses a set of questions or statements derived from the adopted excellence framework. The questionnaires collapse the criteria into a series of summary statements that require respondents to assess the current status of performance of their organization on a relatively simple scale. At the simplest level, yes-no responses are recorded while others employ Likert-type interval scales. Some can use a 0-100% scale while a four-point scale can be used to overcome a respondent's tendency to choose the middle option. The questionnaires usually contain up to 100 questions to address all criteria. The questionnaire approach is the least resource-hungry approach and can be completed very quickly."

The matrix approach

"The matrix approach involves the development of an achievement matrix built on the excellence framework adopted by the organization. The matrix should cover all categories of the framework with the steps listed in a logical sequence under each category."

The workshop approach

"Groups such as management teams, departmental teams, and improvement teams use the criteria

to guide their discussions on strengths and improvement opportunities. An assessor will facilitate the discussions."

The pro-forma approach

"This approach reduces the amount of work involved in undertaking and documenting self-assessment. A set of one-page pro formas can be developed for each Criterion and the unit's staff then complete it."

Award-type process

"Involves the preparation of a document describing what the organization has achieved and is achieving, and how the results are actually received. Two teams are involved; while one gathers information and writes the report the second will assess the information."

E-approaches

"The questionnaires, matrix and pro-formas lend themselves to e-data capture methods via a PC-based checklist, questionnaire and pro-forma. The approach is similar to the other approaches with small variation to accommodate the e-approach."

Hybrid approaches

"This involves a combination of several of the approaches as discussed above."

Process approaches

"Processes can be assessed using an excellent cause-and-effect diagram, i.e. the Fishbone diagram."

2.11.2.2 Benefits of self-assessment

Porter and Tanner (2004:40) derived the following benefits from self-assessment in the different case study organizations they targeted:

- "Identify areas for improvement;
- Provide a focus or driver for continuous improvement;
- Coordinate ad hoc improvement activities;
- Provide a base-line measure of the organization;
- Encourage senior management involvement in business excellence;
- Encourage line management involvement in business excellence;
- Provide motivation for result-driven managers;
- The external benchmarks provide a focus for senior managers;
- Effective means of implementing business excellence;
- Added impetus to TQM implementation;
- Key component in a "phased" approach to business excellence;
- Encourage top-down and bottom-up communication;
- An effective management development tool;
- Increase employee/staff motivation;
- Encourage a team culture and integrated management;
- Promotes a cross-functional (process) perspective;
- Promotes sharing of skills and knowledge;

- Encourage key components of a learning organization;
- Encourage commitment to strategic directives;
- Effective base for a collaborative management approach;
- Give an holistic view of the business;
- Provides a business measurement framework; and
- Can be integrated into business planning."

2.11.2.3 Conclusion: Excellence Models

According to Porter and Tanner (2004:29), "of particular importance is that the Baldridge Award winners provide examples that investment in quality programs can result in cost savings, market share improvement and impressive improvements in manufacturing and service performance."

They acknowledge that "despite the high profile of the Deming Prize, there has been enormous ignorance in the west surrounding how judgements are made and what weightings have been given to the different categories. It is not known how assessors have been trained and all of this made it extremely difficult to transfer the framework and assessment process to an internal self-assessment system."

2.11.2.4 Critical Success Factors: specific to Excellence Models

- There must be an understanding of the constraints on which each Critical Success Factor depends, for it is from understanding the constraints that both the Critical Success Factor and the measures for each Critical Success Factor are derived; and
- The model must be constructed in such a way that management can assess, without additional research and investigation, which functionality should be focused on.

2.12 SHORTCOMINGS AND LIMITATIONS OF PREVIOUS RESEARCH

There have been several limitations in previous research and discussions pertaining to Business Process Management as a Critical Core Capability. These discussions lacked a comprehensive framework that encompasses an holistic view of Business Process Management as a management function on the level of an organization's Critical Core Capabilities.

During the literature search that was performed it was determined that most previous research did not focus on the "management perspective" of process management but focused on the process improvement activities on an operational level. Although it is evident that there is an understanding of Business Process Management as an holistic function, no comprehensive research covering the holistic view as identified by certain authors could be found.

To address these shortcomings in the existing research, this research paper focused on providing an holistic view of Business Process Management as a Critical Core Capability of an organization.

As far as the existence or development of assessment models to measure Business Process Management as a management function is concerned, no model could be found. Excellence models touch on Business Process Management as one of their criteria but do not comprehensively investigate or assess it to the full.

2.13 CONCLUSION

The literature provided significant support and confirmation for the argument raised by the researcher that the Business Process Management functionality entails much more than just process improvement activities. The verification and analysis of the Business Process Management Model and the elements identified will be fully discussed in chapters 3 and 4. The literature furthermore provided sufficient information to answer the research questions as set out in Chapter 1 i.e. *What must be implemented in terms of strategies, governance, enterprise architecture, and process optimization, to ensure that organization culture, people's behavior and the work environment will be conducive to successfully establish and maintain Business Process Management as a Critical Core Capability of an organization?*

Sufficient qualitative information was gathered within the literature to substantiate the relevancy and importance of the elements as identified in the Business Process Management framework compiled by the researcher from the literature reviewed.

Will the understanding of the concepts, contents, and importance of Business Process Management contribute to acceptance on all levels in the organization of responsibilities and accountabilities of the concept and initiatives?

The literature further clearly states the changed perception of the concept Business Process Management and the fact that the understanding of the more holistic definition has contributed to the elevation of the functionality to Critical Core Capability status.

How and how often should organizations assess individual business units as well as the organization as a whole, in terms of the readiness and capabilities regarding the effective management of Business Process Management functionalities?

From the literature it is clear that assessment and self-assessment form an integral part of an organization's endeavor to remain competitive. As the external environment changes, the organization's internal processes and efficiencies change, therefore assessment is a frequent exercise.

Porter and Tanner (2004:3-7) clearly state that "assessing business excellence, or organizational excellence, is an essential part of the learning and measurement process, which involves people in self-assessment and allows organizations to identify strengths and improvement opportunities. Furthermore, it enables the systematic progress monitoring of excellence programs. Self-assessment is a comprehensive, systematic and regular review of an organization's activities and results referenced against an appropriate business excellence model. These types of business or organizational assessments are some of the most powerful organizational learning tools available."

Throughout the literature study it was clear that management plays a major role in obtaining and maintaining organizational excellence. Within these endeavors, management needs a clear vision of the current and desired future state of the organization's Critical Core Capabilities and should perform a fully-fledged management function regarding the functionality and people. Management should also constantly assess the social and psychological needs of the individual and the effect that change endeavors will have on it per se.

The Information Systems Audit and Control Foundation (2000:8) states that "Management needs a measurement instrument to grade the organization against a specific scale to determine:

- The current status of the organization — where the organization is today;
- The current status of best-in-class in the industry — the comparison;
- The current status of international standards — additional comparison; and
- The organization's strategy for improvement — where the organization wants to be."

It is believed that the detail defining of the Business Process Management functionality as well as the development of the BPMCAM will enhance the understanding of the concept and will increase organization's ability to remain competitive through their Business Process Management capabilities.

Having discussed in depth the enormous impact that the field of Business Process Management as defined in this study have on the individual, the group and the organization it is also appropriate to acknowledge the enormous effect that individuals in reverse have on the organization.

According to Ivancevich et al. (2005:77) "Individual differences have a direct effect on behavior. Every person is unique because of their background, individual characteristics, needs and how they perceive the world and other individuals. Due to this individuals respond different to directives and interact differently with bosses, co-workers, subordinates and customers. In a multitude of different ways individual differences shape organizational behavior and consequently, organizational and individual success. This explains why some people embrace change while others fear it, why some people are productive without supervision and some needs to be closely supervised."

In this chapter an overview was given and the views of different authors were discussed pertaining to the eleven criteria as well as the Critical Success Factors within every criterion. Every researched area was concluded by a summary of the main Critical Success Factors to be included in the measurement instrument and evidence was provided of the importance of the eleven contributing areas. The impact of changes to the individual's job environment on individual behavior as well as the impact of individual differences and behavior on the organization's behavior and ultimate success was also highlighted.

Chapter 3 will elaborate on the purpose of the research and the researchers understanding of the research methodology is illustrated via the proposed research process, (Figure 3.1) research approach (Figure 3.2) as well as the research steps (Figure 3.3).

CHAPTER 3

RESEARCH METHODOLOGY AND DESIGN

3.1 INTRODUCTION

In the previous chapter an in-depth discussion of the researched literature was conducted. The researched literature was analyzed and the Critical Success Factors pertaining to the different research areas were identified to be included in the proposed measurement instrument.

In this chapter the research rationale, design, steps and methodology used to conduct the research are discussed. The utilization of both qualitative and quantitative research methodologies, as well as inductive and deductive reasoning in the research process is discussed and the specific steps to be performed to answer the research questions are defined. The purpose of the utilization of expert opinions as well as structured questionnaires is defined.

3.2 THEORETICAL FRAMEWORK

According to Leedy (1997:3-5), "research can be defined as the systematic process of collecting and analyzing information (data) in order to increase the understanding of the phenomenon which is under consideration or in which the interest is." The same author further states that "research is a process through which an attempt is made to systematically achieve with the support of data, the answer to a question, the resolution of a problem or greater understanding of a phenomenon."

According to Cooper and Schindler (2001:16-18), "good research follows the standards of the scientific method." They pose the following nine criteria that provide what is desirable in decision-oriented research:

- "Purpose clearly defined: The purpose of the research, the problem involved or the decision to be made, should be clearly defined, sharply delineated and as unambiguous as possible;
- Research process detailed: The research procedure used should be described in sufficient detail to permit another researcher to repeat the research;
- Research design thoroughly planned: The procedural design of the research should be carefully planned to yield results that are as objective as possible;
- High ethical standards applicable: A research design that safeguards against causing mental or physical harm to participants and makes data integrity a first priority, should be highly valued;
- Limitations frankly revealed: The researcher should report, with complete frankness, flaws in procedural design and estimate their effect on the findings;
- Adequate analysis for decision maker's needs: Analysis of data should be extensive enough to reveal significance and the methods of analysis used should be appropriate;
- Findings presented unambiguously: Some evidence of the competence and integrity of the researcher may be found in the report;
- Conclusions justified: Conclusions should be limited to those for which the data provide an adequate basis; and
- Researcher's experience reflected: Greater confidence in the researcher is warranted if the researcher is experienced, reputable and a person of integrity."

3.2.1 Research Process

In order to ensure a focused, systematic and scientific process, the research process utilized in this study, to a large degree, resembles the Research Process Model as defined by Cooper and Schindler (2001:61) (See figure 3.1).

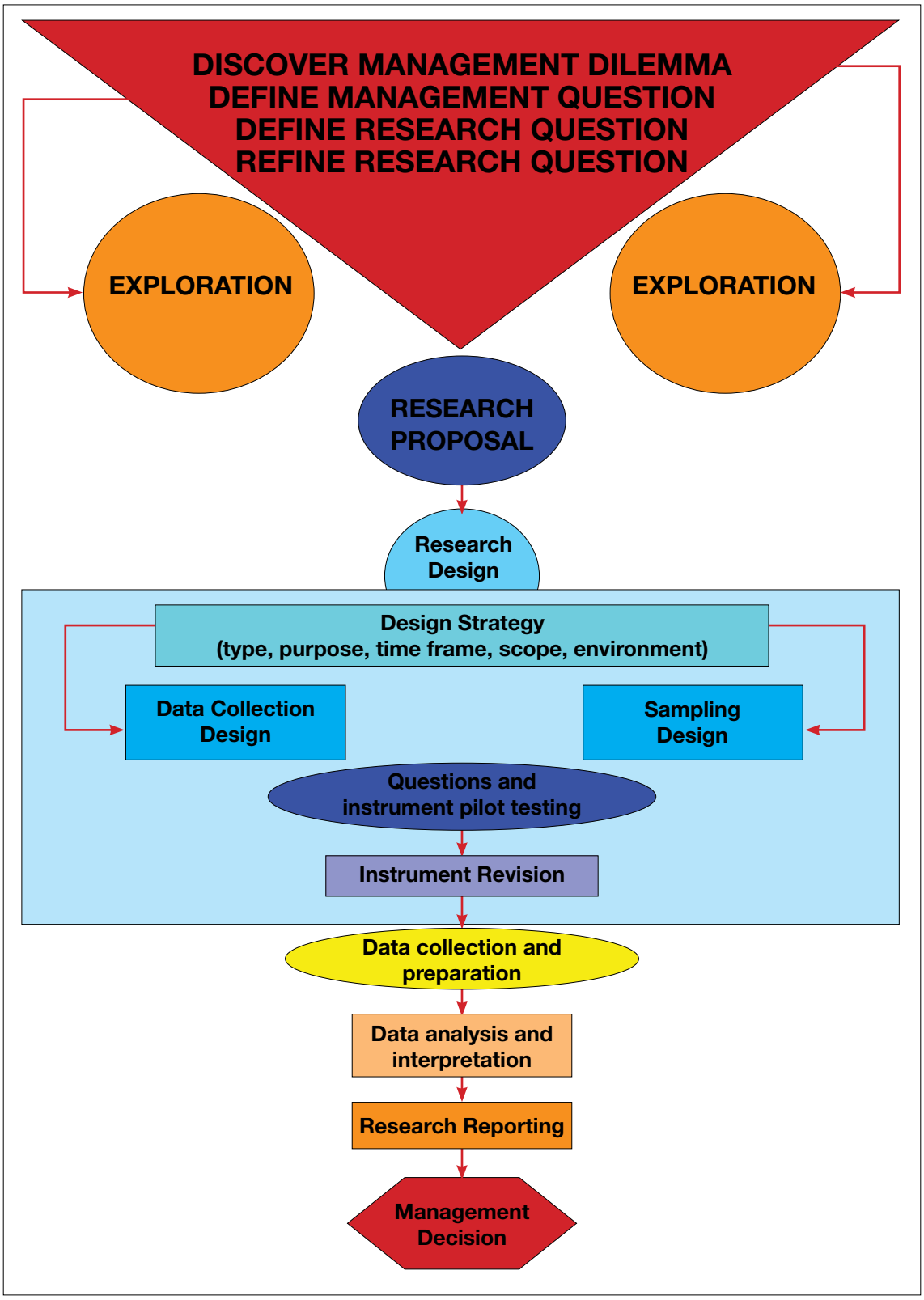

Figure 3.1 Research Process Model (Cooper and Schindler, 2001)

3.3 RESEARCH DESIGN AND METHODOLOGY: CONCEPT

According to Mouton (2001:49), the Research Design answers questions such as:

- "What kind of study will be performed?
- What type of study will best answer the research questions? and
- What kind of result is aimed at?"

In order to pitch the above, as well as this research, at the right level, it is important that there is an understanding of the differences in the levels or worlds of research. Mouton's (2001:137-140) "Three Worlds Framework" assists in clarifying the levels of scientific research where:

- "World 1: The world of everyday life and lay knowledge;
  - Social/practical problems (crime, unemployment, learning problems, stress, violence, etcetera); and
  - Require intervention/action/programs/therapy."
- "World 2: The world of science and scientific research."

  "Body of Knowledge
  - Theories, models, typologies;
  - Concepts and definitions;
  - Findings and data; and
  - Instrumentation, scales, tests and questionnaires."

  "Research Process
  - Problem statement – design – methodology – conclusion.
  - World 3: The world of Meta-science.
    - Paradigms in the philosophy of science e.g. positivism, realism, postmodernism, critical theory, and phenomenology; and
    - Paradigms in research methodology, e.g. quantitative, qualitative and participatory action research."

The research described in this thesis clearly fits into worlds 2 and 3 as can be identified through the following clarification.

Both qualitative and quantitative research methodologies, as well as inductive and deductive reasoning, are utilized in this study. The study was planned as a two-stage design as the research can be seen as an exploratory and descriptive study. In-depth literature reviews have been performed to identify and define key concepts as identified by the researcher during the exploratory and descriptive study.

The Research Methodology focuses on the research process and the kind of tools and procedures to be utilized resides within world 2 - Science and Scientific research, as well within world 3 – Meta-science (Mouton, 2001:137-142).

According to Cooper and Schindler (2001:34) "we reason with varying degrees of success and communicate our message, called meaning, in ordinary language or, in special cases, in symbolic logical form. Our meaning is conveyed through exposition and argument. Two types of argument of great importance to research are deduction and induction."

"Deductive reasoning is a form of inference that purports to be conclusive – the conclusion must necessarily follow from the reason given. The reason is said to imply the conclusion and represent proof. There is a much stronger and different bond between reason and conclusion than is found with inductive reasoning."

"Inductive reasoning is radically different. There is no such strength of relationship between reasons and conclusions in inductions. To induce is to draw a conclusion from one or more particular facts or pieces of evidence."

"Inductive reasoning and deductive reasoning are used in research reasoning in a sequential manner." According to Cooper and Schindler (2001:34) "John Dewey describes this as the double movement of reflective thought. Induction occurs when we observe a fact and ask, "Why is this?" In answer to this question, we advance a tentative explanation (hypothesis). The hypothesis is plausible if it explains the event or condition (fact) that prompted the question. Deduction is the process by which we test whether the hypothesis is capable of explaining the fact."

In order to depict the tools, methods, and reasoning that will be utilized in the study according to what is required to answer the stated research questions the researcher developed the following approach (Figure 3.2) according to the argument of du Plessis (2004:78).

Research Questions	Methodology	Reasoning
1. What must be implemented in terms of strategies, structures, systems, and processes, to ensure that organizational culture, people's behavior and the work environment will be conducive to successfully establish and maintain Business Process Management as a Critical Core Capability?	Exploratory study Descriptive study Literature study Qualitative research	Deductive
2. Will the understanding of the concepts, contents, and importance of Business Process Management contribute to acceptance on all levels in the organization of responsibilities and accountabilities of the concept and initiatives?	Descriptive study Literature study Organization analysis and testing of the hypothesis	Inductive
3. How and how often should organizations assess individual business units as well as the organization as a whole, in terms of the readiness and capabilities regarding the effective management of the Business Process Management functionality?	Literature study Documentation review Evaluation of content validity Scale development Development of survey questionnaire Statistical analysis Development of the BPMCAM Organization analysis	Inductive Deductive

Figure 3.2 Methodological Approach used in this Research (Designed by Researcher)

3.3.1 Qualitative Research

According to Schurink (2002) "qualitative research is an interdisciplinary field." As Denzin and Lincoln (2000:7) put it: "The field sprawls between and crosscuts all of the human disciplines, even including, in some cases, the physical sciences. Qualitative research is not a new approach to social study. It covers millenniums!"

The following (Figure 3.3) indicates the steps that will be followed within the research process.

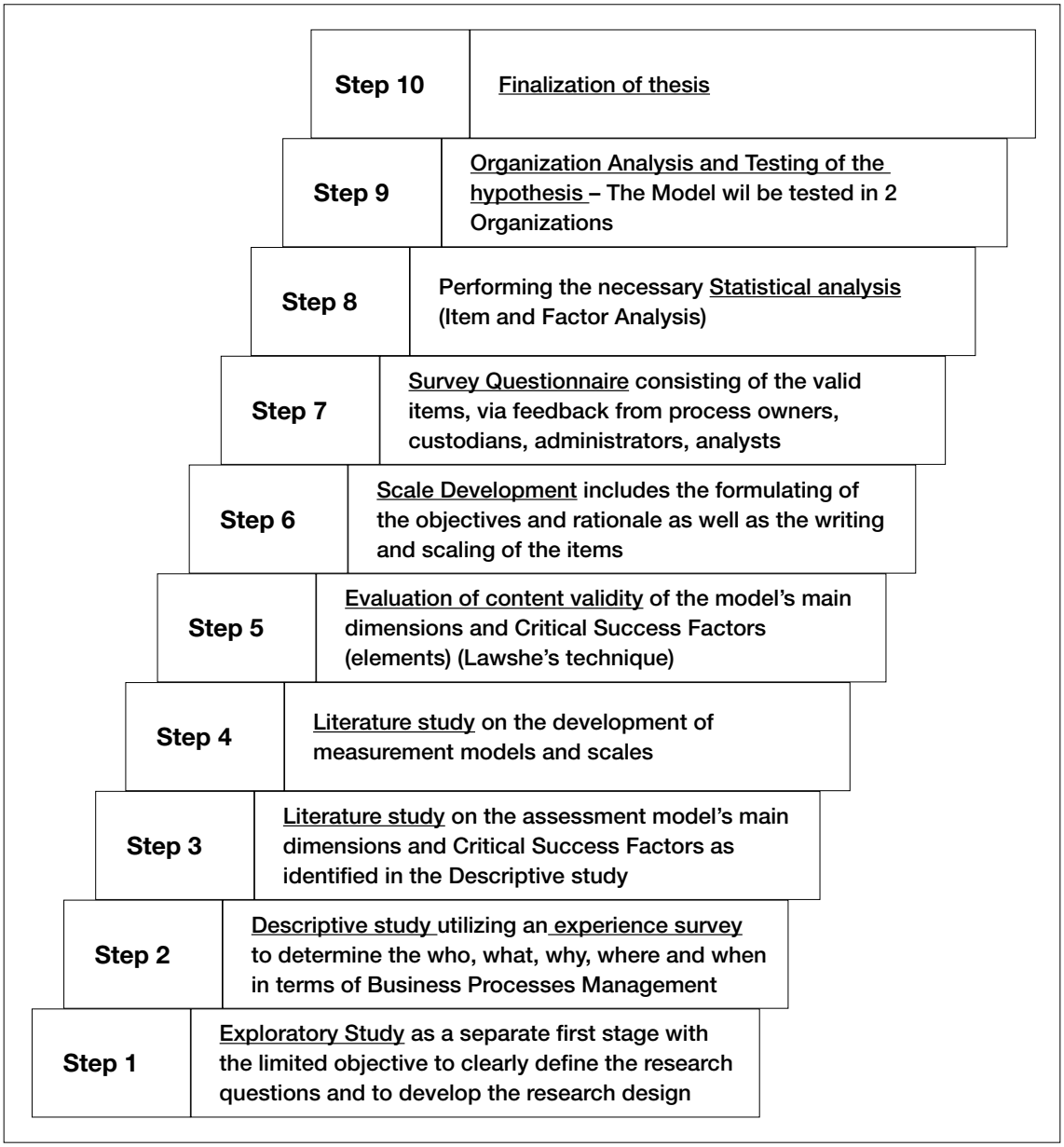

Figure 3.3 Research Process Steps (Designed by Researcher)

3.3.1.1 Exploratory Study – Step 1

According to Cooper and Schindler (2001:259), the objective of an exploratory study is:

- "To expand the understanding of the management dilemma;
- To gather background information on the topic;

- To identify information that should be gathered; and
- To identify sources of information for questions to be constructed."

An exploratory study was performed during 2003/4 as a separate first stage with the limited objective to obtain first-hand information on the subject as perceived and performed in reality in organizations in order to clearly define the research questions and to develop the research design. A qualitative research approach was followed during this phase that focused on one-on-one interviews with knowledgeable and expert people as well as insight into existing documentation within the entity on the subject.

In-depth interviews

On a conversational basis in-depth interviews were conducted with colleagues and people from other organizations - all active full-time in either a management role or process improvement role within the Business Process Management environment. The conversations further included staff from the Human Resources and Training areas of the organizations. The aim of the conversations with the process management staff was to identify the different facets and tasks regarding Business Process Management performed on an operational level.

The questions utilized during these sessions were constructed to obtain the "what", "where", "who", "why", "when" information needed to form an holistic view on an operational level.

This information was then mapped to the human resources and training facets of the functionality to obtain the "what", "where", "who", "why", "when" detail for the requirements regarding human resources and training. An initial Business Process Management framework covering the operational activities was developed from this information.

Expert interviews

Once the initial Business Process Management framework was done, expert interviews with managers, process analysts, process owners and business efficiency consultants were conducted with the specific aim to validate the facets and tasks. It was also aimed to extend the framework with a detailed view of the facets and tasks specific to the "management" functions of Business Process Management as performed by the different entities on an operational and tactical level as well as on a centralized and decentralized basis. The questions again focused on the "what", "where" "who", "why", "when" aspects of the positions. The interviews also clarified most of the inputs needed from a strategic level, enabling Business Process Management on a tactical and operational level.

After the interviews were finalized an intensive analysis of documents within the public domain of the organization was performed to obtain information ranging from Job Descriptions, Performance Development, Business Process Management structures to the more strategic information regarding the high-level "Management Processes" and the fit of Business Process Management as a Critical Core Capability into the Balanced Scorecard, etcetera.

The Business Process Management framework was updated with the additional information and was utilized as a guide to determine the appropriate research literature.

3.3.1.2 Descriptive Study – Step 2

According to Cooper and Schindler (2001:12) "the descriptive study describes the characteristics ("who, what, why, where and when"). With a descriptive study, the researcher often attempts to describe or define a subject by creating a profile of the data, people or problems."

Based on the intelligence derived from the exploratory study and with the Business Process Management framework as a guide the researcher embarked on a comprehensive formal descriptive study to comprehensively clarify from a literature perspective the "who", "what", "where", "when" and the "how much" regarding Business Process Management as a Critical Core Capability. Precise research questions were formulated (See chapter 1).

3.3.1.3 The Literature Review – Step 3 and 4

The literature review included secondary sources in the form of dictionaries, handbooks, magazines, articles, training material, presentations and internet articles. (See chapter 6).
The areas reviewed included the following:

- Process, Business Process Management and Business Process Management Critical Success Factors;
- Strategy (regarding Business Process Management as a Critical Core Capability);
- Governance and governance factors (regarding Business Process Management as a Critical Core Capability);
- Measurement (regarding Business Process Management as a Critical Core Capability);
- Assessment of Business Process Management and assessment models;
- Development of the Business Process Management Competency Assessment Model; and
- Critical Core Capabilities, Balanced Scorecard, Excellence Models, etcetera.

The study included the further population of the Business Process Management framework and the development of the Business Process Management Model.

Du Plessis (2004:5) stated that "A broad definition of the concept is both functionally and operationally more useful because it can be adapted to suit the specific needs of a particular organization". The researcher therefore developed the more detailed Business Process Management framework (See figure 3.4) from the intelligence derived via the exploratory and descriptive studies in order to guide the development of the model and the reader's understanding of the scope and detail of the field under study.

Eleven criteria related to the functions that need to be managed if the function is perceived to be a Critical Core Capability were identified by the researcher. The researcher then renamed and defined these criteria to specifically suit the Business Process Management environment. The Business Process Management framework (see figure 3.4) constituting the eleven criteria was utilized to formalise the scope of the BPMCAM (Figure 3.5).

CORPORATE STRATEGY (Criterion 1)	
BUSINESS STRATEGY (Criterion 2)	
GOVERNANCE (Criterion 3)	
ENTERPRISE ARCHITECTURE (Criterion 4)	**OPTIMIZATION (Criteron 8)**

1 INFRASTRUCTURE (Criterion 5)
• Structures (Centralized/decentralized)
• Roles, responsibilities, competencies and skills (Functional and Generic)
  • Management/Leadership
  • Steering Committees
  • Process Ownership
  • Process Custodianship/Administratorship
  • Business Process Analysts/Process Engineers
  • Project Teams
  • External Consultants
  • Stakeholders
• Management of People
  • Training
  • Measurement and Appraisal
  • Reward and Remuneration
  • Communication
  • Perceptiveness to change
	1 PROCESS IMPROVEMENT (Criterion 9)
	• Identification of improvement opportunities
	• Process Improvement Methodologies
	  • BPR
	  • Business Process Redesign
	  • Continuous Process Improvement
	  • Performance Enablers
	• Process Improvement Models (PDCA)
	• Analysis Techniques
	  • Observation/Interviews
	  • Performance Analysis, etcetera
	• Process Improvement Techniques
	  • Strategic Techniques
	  • Tactical Techniques
	  • Operational Techniques

2 SYSTEMS & INFORMATION ARCHITECTURE (Criterion 6)
• Software packages
  • Flow-diagramming Tools
  • CASE Tools
  • Simulation Tools, etcetera
• Repository/Databases
• Automation
• Publishing
• Quality Control
• Links to other Systems
• Control of Change Management
	2 PROCESS REVIEW CYCLE (Criterion 10)
	• Review during the optimization phase of the process life cycle
	• Review during operational phase of the process life cycle

3 PROCESS ARCHITECTURE (Criterion 7)
• Taxonomy
  • Value Chain
  • Functional
  • Product Life cycle
• Level of Decomposition
  • Enterprize Level
  • Main Process Level
  • Sub-process Level
  • Activity Level
  • Task Level
• Process modeling/models
• Type of Process Maps
  • Workflow
  • Affinity
  • Relationship
• Standards
• Naming Convention
• Language Rules
• Process Time Indicators
• Process Cost Indicators
• Process Goals
• Quality Control
• Change Implementation Control
• Sign-off
	3 STANDARDS & MEASURES (Criterion 11)
	• Responsibility: Per business unit, enterprize-wide, and individuals
	• Measurement Standards
	  • Standardized measures
	  • Relative measures
	• Measurement Techniques
	  • Balanced Scorecard
	  • Benchmarking
	  • Conformance to Standards
	  • Fit for Purpose
	  • Customer/Ssupplier
	  • Staffing
	  • Cost/Time/Quality

Figure 3.4 Business Process Management Framework used in this Research (Designed by Researcher)

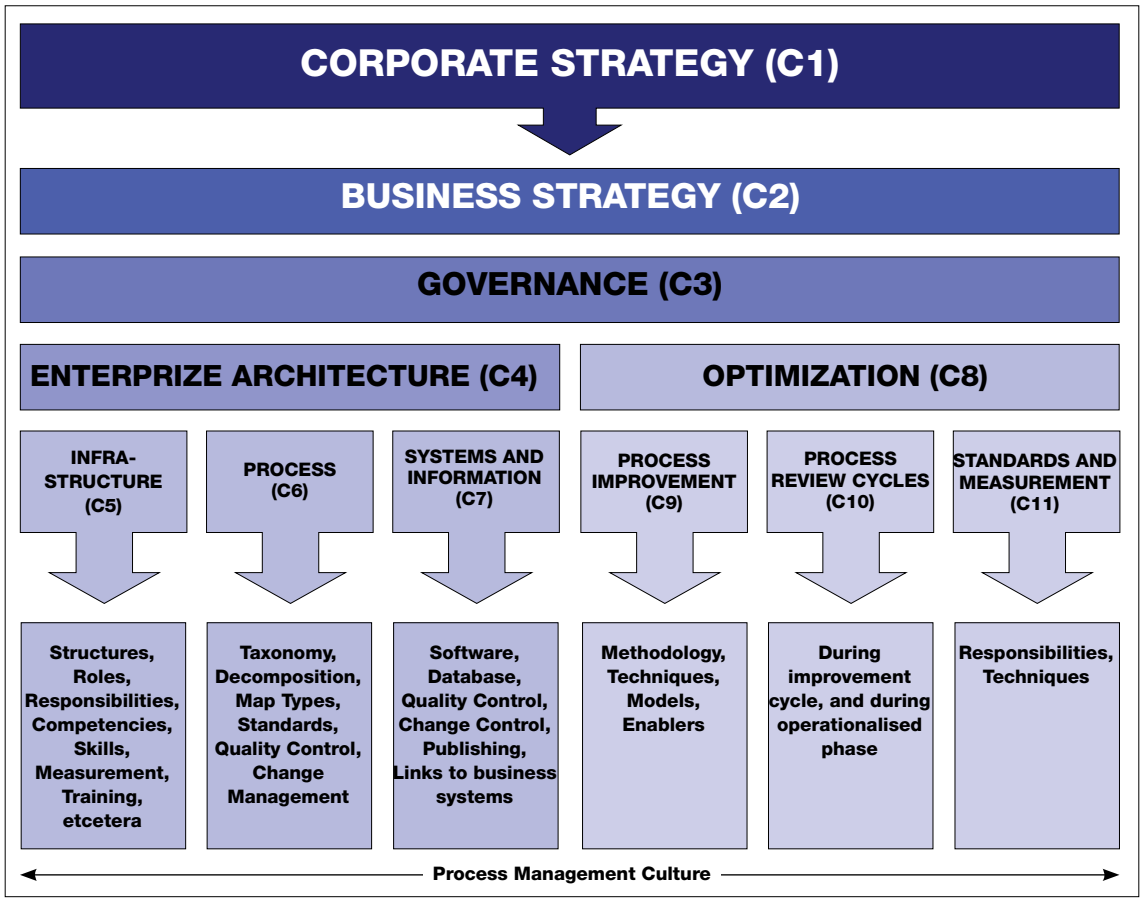

Figure 3.5 Business Process Management Model designed for this Research (Designed by Researcher)

On the basis of the comprehensive Business Process Management framework, the researcher defined thirty Critical Success Factors supported by various Guiding Principles with regards to successful management of the Business Process Management functionality.

These criteria, Critical Success Factors and Guiding Principles constituted the Relevancy Questionnaire that was sent out to respondents (See Annexure "A").

3.3.2 The Empirical Phase: Participants and Sampling

The measurement part of the study had two different focuses and therefore different sample groups were utilized during the measurement phases.

Phase One covered the measurement of the model's content validity, i.e. the eleven criteria, thirty Critical Success Factors and various supporting principles to the Business Process Management functionality; and

Phase Two involved the measurement of the validity of the BPMCAM as an assessment model.

The Sampling Design followed during the measurement phase was Non-probability Sampling. The Method utilized was Purposive Sampling – and more specific Judgment Sampling. Judgment

Sampling was utilized due to the fact that in every measurement the sample members had to conform to certain Criteria i.e,. knowledge and experience of Business Process Management, etcetera (See paragraphs 3.3.3 and 3.3.4 for specific criteria).

3.3.3 Evaluation of Content Validity of Model – Step 5

Content Verification/Validation Part

The content validity was verified via the utilization of a Relevancy questionnaire (see Annexure "A") to measure the extent to which the framework provides adequate coverage of the investigative questions guiding the study. The Relevancy questionnaire comprised 11 criteria and 89 Critical Success Factors, adding up to 100 questions in total.

The Relevancy questionnaire was forwarded to a pool of seventy-five people who are actively working within the Business Process Management environment in various organizations, operating in industries including financial services, mining, manufacturing, communication, transport, technology and educational institutions. This pool included positions such as process owners, process custodians, process administrators, process analysts, business analysts, work-study officers, process engineers, lecturers, independent training consultants, independent Business Process Management consultants, human resource business partners and training managers. The selected individuals were involved on the operational, tactical and strategic levels as well as centralized and decentralized to the Business Process Management functions. The individuals further operated in both the management and optimization arenas of Business Process Management. The group of specialists received the same questionnaire and independently assessed whether the items met the standard. (See Table 4.1 (Chapter 4) for Biographical Information on Respondents).

Of the seventy-five questionnaires sent out sixty-four questionnaires were returned. All of the returned questionnaires were unspoiled and could be used. The number of responses (n=64), represented an eighty-five percent response rate.

Lawshe's (1975) "content validity technique" was utilized to assess the validity and is discussed comprehensively in chapter 4 paragraph 4.2.1.

3.3.4 Development of the BPMCAM – Scale Development – Step 6

Certain steps of the scale development process described by DeVellis were utilized. DeVellis (1991:8-9) states that "measurement is a fundamental activity of science - whatever the initial motives, each area of science develops its own set of measurement procedures."

DeVellis (1991:1-2) further states that "the quantification of a particular phenomenon in research where there are either inappropriate or unavailable measurement tools, the development of a measurement instrument seems to be the only option."

The Information Systems Audit and Control Foundation (2000:8) states that "assessment models entail the developing of a method of scoring so that an organization can grade itself against a specific scale" to determine:

- "The current status of the organization — where the organization is today;
- The current status of (best-in-class) in the industry — the comparison;

- The current status of international standards — additional comparison; and
- The organization's strategy for improvement — where the organization aims to be."

DeVellis (1991:3) indicates that "measurement scales are instruments that are collections of items intended to reveal levels of theoretical variables, not readily observable by direct means. We develop scales when we want to measure phenomena that we believe to exist because of our theoretical understanding of the world, but which we cannot assess directly."

DeVellis (1991:51-80) proposes an eight-step model for the development of a scale instrument. The first two steps ensure substantive validity and the last six steps focus on structural validity. The first two steps of DeVellis' model have been performed as Step 1: Determine clearly what it is you want to measure, and Step 2: Generate an item pool (See paragraphs 3.3.1.1 and 3.3.1.2). Steps 3 to 8 are discussed below according to DeVellis' model.

Step 3: Determine the format for measurement

"Several scales exist (Thurston, Guttman, Equal Weighted Items, and Likert Scale), but not all scales are suitable for all types of assessments. This underlines the importance of choosing the correct format. The Likert-type scale is viewed as the more accepted scale format. A good Likert item should state the opinion, attitude, beliefs, or other cost constructs under study in clear terms. The Likert-type scale lends itself to several different response formats, e.g. frequency format (never to always), degree format (not at all to very much), similarity format (like me to not like me), and the agreement format (strongly agree to strongly disagree)."

It was decided to utilize the 'strongly agree to strongly disagree' format because it suited the question sets best.

"1 = strongly disagree
2 = disagree
3 = neither disagree nor agree
4 = agree
5 = strongly agree"

Step 4: Have initial item pool reviewed by experts

"Having experts review your item pool can either confirm or invalidate your definition of the phenomenon. You can ask your panel of experts (colleagues who have worked extensively with the construct in question or related phenomena) to rate how relevant they think each item is to what you intend to measure. The mechanics of obtaining evaluations of item relevance usually involves providing the expert panel with your working definition of the construct."

The researcher performed this step as step number 5 in her step-by-step planning (See figure 3.3).

Step 5: Consider inclusion of validation items

"The inclusion of items to test respondents' tendency to rate items according to a set pattern e.g. all responses more positive or more negative, etcetera is one type of validity to be checked. The validation of content, validity and constructs are also extremely important. Validation items were included in both the content validity and scale development questionnaires."

Step 6: Administer items to a development sample

DeVellis (1991:54) proposes the "inclusion of the validated items in a questionnaire that are forwarded to a sample of subjects (that are representative of the population under study)."

Based on DeVellis's steps a Scale Development Survey questionnaire was developed, by the researcher comprising 93 items. The initial 93 items (see Annexure "B"), were divided into the following criteria (Sub-scales) based on the key areas covered by the model:

- Strategy formulation and governance of the Business Process Management function;
- Structure, roles, responsibilities, policies, procedures and people management for the Business Process Management function;
- The way the Business Process Management function sustains and manages "process architecture";
- The way the Business Process Management function sustains and manages "systems and information architecture";
- The way the organization remains competitive through optimizing and improving current business processes;
- The way the organization ensures continuous improvement of business processes; and
- The way the organization evaluates and assesses business processes against appropriate standards.

The Criteria used in the participant selection was that the sample must include people that are continuously and actively working in the Business Process Management environment, people utilizing the functionality and outputs of the Business Process Management functionality and scholars of Business Process Management, i.e.:

- People who currently operate in the Business Process Management domain, i.e. process owners, process custodians, process administrators, process analysts, business analysts, work-study officers, IT consultants and process engineers;
- People who utilize processes and the functionalities offered by Business Process Management, i.e. manufacturing, sales, mining, project managers, etc;
- People who hold academic qualifications regarding Business Process Management and business process improvement, i.e. MBL and MBA students, Lecturers etcetera;
- Management, i.e. Line Managers to whom processes are essential, general management members that were more involved in policy and strategy regarding Critical Core Capabilities; and
- Managers that head up Business Process Management departments for their respective organizations.

A pool of 374 people randomly selected from the above criteria was utilized for the assessment part of the tool. (See Table 4.3 for Biographical Information on Respondents). According to DeVellis (1991:51-80) "the rule of thumb on scale development is that approximately 300 responses are needed to factorise items successfully. However if the items in the questionnaire are divided into sub-scales the responses could be less than 300 (5 responses per item)." The maximum number of items per sub-scale was 43; therefore the minimum number of responses needed was 215 (43x5). Of the 374 questionnaires sent out, 313 were returned unspoiled. The number of unspoiled responses (N = 313) represents a response rate of 84%. The number of responses was adequate to continue with scale development.

Step 7: Evaluate the items – Item Analysis

"In this step items are evaluated to determine which items should be included in the item pool and which items should be excluded. Factors that are considered here are inter-item correlation, validity of items, internal consistency reliability, and item scale correlation."

The 313 unspoiled responses were analyzed with the assistance of Statisticians from the Department of Statistics of the University of Pretoria. The statistical program utilized for the analysis was the Conventional Item and Test Analysis Program (ITEMAN version 3.6).

Item analysis on the initial 93 items was done to determine construct validity by means of a Pearson correlation. No item had an item scale correlation of ≤ 0.32 and therefore no items were eliminated from the item pool.

Step 8: Optimize scale length

All of the 93 items within the seven criteria had an acceptable reliability and were retained within the pool. Each of the seven criteria was subject to Exploratory Factor Analysis (EFA) using the Conventional Item and Test Analysis Program (ITEMAN version 3.6) to determine the underlying scales or factor structure.

Although the intent throughout the development of the measurement instrument was to perform analysis on the instrument and later within organizations according to the 11 predetermined criteria, the researcher performed additional factor analysis on the total number of items (93) for completeness and comprehensiveness, irrespective of criteria clustering.

According to the University of Texas at Austin Statistical Services, (1995) "Factor Analysis is a generic term used for a family of statistical techniques concerned with the reduction of a set of observable variables in terms of a small number of latent factors. It has been developed primarily for analyzing relationships amongst a number of measurable entities (such as survey items or test scores). The underlying assumption of Factor Analysis is that a number of unobserved latent variables (or "factors") exist that account for the correlations amongst observed variables, such that if the latent variables are partialled out or held constant, the partial correlations among observed variables all become zero. In other words, the latent factors determine the values of the observed variables."

"The primary purpose of Factor Analysis is data reduction and summarization. Factor Analysis has been widely used, especially in the behavioral sciences, to assess the construct validity of a test or a scale. The output from the Factor Analysis procedure will be reflected in a number of observed variables with a related number of factor-loading matrices, which represented the relationships amongst the observed variables and the latent factors. The number of factors extracted and the pattern of relationships among the observed variables and the factors provide the researcher with information on the construct validity of the test battery."

"Determining the optimum number of factors to extract is not a straightforward task, since the decision is ultimately subjective. There are several criteria for the number of factors to be extracted, but these are just empirical guidelines rather than an exact quantitative solution. In practice, most factor analysts seldom use a single criteria to decide on the number of factors to extract. Some

of the most commonly used guidelines are the Kaiser-Guttman rule, Percentage of Variance, the Scree test, Size of the Residuals, and Interpretability and rotation of factors." The aforementioned guidelines are discussed below according to the definitions by the University of Texas at Austin Statistical Services (1995).

Kaiser-Guttman rule

"The "Eigenvalues greater than one" rule has been most commonly used due to its simple nature and availability in various computer packages. It states that the number of factors to be extracted should be equal to the number of factors having an Eigenvalue (variance) greater than 1.0. The rationale for choosing this particular value is that a factor must have variance at least as large as that of a single standardized original variable."

Percentage of Variance

"Another criterion, related to the latent root criterion, is the percentage or proportion of the common variance (defined by the sum of communality estimates) that is explained by successive factors."

Scree test

"Plotting the Eigenvalues against the corresponding factor numbers sometimes provides insight into the maximum number of factors to extract. The SCREE option in the PROC FACTOR statement produces a Scree plot that illustrates the rate of change in the magnitude of the Eigenvalues for the factors. The rate of decline tends to be fast for the first few factors but then levels off. The "elbow", or the point at which the curve bends, is considered to indicate the maximum number of factors to extract."

Interpretability

"Another very important criterion that is often overlooked in determining the number of factors is the interpretability of the factors extracted. Factor solutions should be evaluated not only according to empirical criteria but also according to the criteria of "theoretical meaningfulness". Extracting more factors will guarantee that the residual correlations get smaller and thus that the chi-square values get smaller relative to the number of degrees of freedom. However, non-interpretable factors may have little utility. That is, an interpretable three-factor solution may be more useful (not to mention more parsimonious) than a less interpretable four-factor solution with a better goodness-of-fit statistic."

The Rotation of Factors

"Once you decide on the number of factors to extract, the next logical step is to determine the method of rotation. The fundamental theorem of Factor Analysis is invariant within rotations. That is, the initial factor pattern matrix is not unique. We can get an infinite number of solutions, which produce the same correlation matrix, by rotating the reference axes of the factor solution to simplify the factor structure and to achieve a more meaningful and interpretable solution. The idea of simple structure has provided the most common basis for rotation, the goal being to rotate the factors simultaneously so as to have as many zero loadings on each factor as possible."

"The simplest case of rotation is an orthogonal rotation in which the angle between the reference axes of factors is maintained at 90 degrees. More complicated forms of rotation allow the angle between the reference axes to be other than a right angle, i.e., factors are allowed to be correlated with each other. These types of rotational procedures are referred to as oblique rotations. Orthogonal rotation

procedures are more commonly used than oblique rotation procedures. In some cases, theory may mandate that underlying latent constructs be uncorrelated with each other, and therefore oblique rotation procedures will not be appropriate. In other situations where the correlations between the underlying constructs are not assumed to be zero, oblique rotation procedures may yield simpler and more interpretable factor patterns."

Interpretation of Factors

"One part of the output from a Factor Analysis is a matrix of factor loadings. A factor loading or factor structure matrix is an "n" by "m" matrix of correlations between the original variables and their factors, where "n" is the number of variables and "m" is the number of retained factors. When an oblique rotation method is performed, the output also includes a factor pattern matrix, which is a matrix of standardized regression coefficients for each of the original variables on the rotated factors. The meaning of the rotated factors is inferred from the variables significantly loaded on their factors. A decision needs to be taken regarding what constitutes a significant loading. A rule of thumb frequently used is that factor loadings greater than 0.30 in absolute value are considered to be significant. This criterion is just a guideline and may need to be adjusted. As the sample size and the number of variables increase, the criteria may need to be adjusted slightly downward; it may need to be adjusted upward as the number of factors increases."

"The factors indicated on a Scree plot with Eigenvalues of 1.00 and higher were considered and were further subjected to Factor Analysis using Principal Factor Analysis with direct oblique rotation and direct oblimin of the items. The sorted rotated factor loading was evaluated and items with a factor loading < 0.30 (without influencing the theoretical construct of an holistic measurement tool) were eliminated."

"A Cronbach Alpha Coefficient for each factor was set at > 0.70. It was noted that the closer to 1.00 the Alpha was, the better, but that should not be the only criterion as the theoretical basis of the tool should also be supported as an holistic tool (Clark and Watson, 1995)."

The final scale with factors derived from this research process was subjected to a final item analysis to confirm the item correlation and to confirm that the correlation was ≥ 0.32.

3.3.5 Testing of the BPMCAM via Survey Questionnaire

The BPMCAM (see Annexure "C") was tested within two organizations, i.e. a large financial institution in Gauteng (Organization "A") and a retail organization in the Western Cape (Organization "B").

Organization "A" has, in the beginning of 2003, commenced with the implementation of a fully-fledged Business Process Management philosophy that included the following:

- Adopting Business Process Management as one of their Critical Core Capabilities;
- Establishing dedicated "Group Support Functions" to oversee and manage Business Process Management supported by dedicated functional positions such as process owners, process custodians, process administrators and process improvement consultants; and
- Adopting the Lean Sigma philosophy at the beginning of 2007.

The questionnaire was forwarded by e-mail to 50 people practising Business Process Management within the different business units in Organization “A”.

Organization “B”, on the other hand, does not practise Business Process Management as a dedicated capability on any organizational level. The questionnaire was forwarded to 24 people within the organization.

It was assumed that in terms of the BPMCAM Organization “A’s” Business Process Management capabilities should be quite mature in most criteria while the BPMCAM should measure Organization “B” as almost the direct opposite from Organization “A”.

The testing was performed in three areas, i.e. a first test where the two organizations were compared and a second test where three business units within Organization “A” were compared, and a third test where the individual three business units in Organization “A” were compared to Organization “B”.

The mean responses in each data construct for the tests performed were compared against the other by using the Mann-Whitney t-test. The results are discussed in full in Chapter 4.

3.3.6 Finalize Thesis and Feedback

The finalization of the Thesis, i.e. completion of chapters and the feedback to the relevant parties within the two organizations, was performed via discussions of the results on all the criteria with specific managers.

3.4 CONCLUSION

This chapter addressed the research methodology used for gathering and analysis of data. The use of the specific research methodology and design was explained as well as the structure and type of questionnaires and the attributes of the target groups. The utilization of item and factor analysis for data interpretation was also discussed.

In chapter 3 the literature of the research process was discussed while chapter 4 will describe the application of the interpretation of the data analysis in the research. Chapter 4 further displays an in-depth coverage of the results of the item and factor analysis performed.

CHAPTER 4

RESULTS AND FINDINGS

4.1 INTRODUCTION

The research methodology and procedures were discussed in the previous chapter which concluded with an introductory discussion on the methodology to be utilized for data analysis i.e. item and factor analysis.

In this chapter, the results and findings based on the experience of the respondents as derived via the data analysis on the empirical part of the study will be discussed. The empirical part of this study was aimed at providing data that could answer the research objectives as stated in chapter 1 of this study.

The primary objective of the research is to develop a Business Process Management Competency Assessment Model based on the identified Critical Success Factors to:

- Measure on a specific scale within the identified Critical Success Factors the readiness of an organization to implement process management as a Critical Core Capability; and
- Measure on a specific scale within the identified Critical Success Factors the capability of an organization to maintain process management as a Critical Core Capability once implemented.

As secondary objectives the research aimed to enhance the understanding of the concept Business Process Management by compiling a comprehensive framework that constitutes the scope of the Business Process Management functionality as a Critical Core Capability within an organization.

The empirical study commenced with the evaluation and verification of content validity by process management experts of the BPMCAM's main criteria and Critical Success Factors developed by the researcher according to the intelligence derived from the literature study (see chapter 2 for details). The verification was done in support of the following research question:

> *What must be implemented, in terms of strategies, governance, enterprize architecture, and process optimization, to ensure that organization culture, people's behavior and the work environment will be conducive to successfully establish and maintain Business Process Management as a Critical Core Capability of an organization?*

4.2 RESULTS AND FINDINGS

The empirical process with the statistical analysis, results and findings consisted of the following steps as set out in chapter 3 of this study (Figure 3.3):

- Evaluation and verification of content validity by process management experts of the BPMCAM's criteria and Critical Success Factors;
- Scale development to facilitate the development of the BPMCAM; and
- Performing the necessary testing of the BPMCAM within two organizations.

4.2.1 Verification of content validity of BPMCAM's Criteria and Critical Success Factors

Lawshe's (1975) "content validity technique" was applied to the criteria and Critical Success Factors as identified from the literature reviewed by the researcher (See Annexure "A" for Relevance Questionnaire). The results are shown in tables 4.1 and 4.2.

Table 4.1 shows the Biographical Information of the expert sample group. Table 4.2 shows the results on the content validity of the criteria and Critical Success Factors as perceived by the expert group of Business Process Management individuals.

Table 4.1 Biographical Information on Expert Group – sample group (N = 64) (Content Validity)

Position Held		
Process Administrator	8	12.50%
Process Custodian	24	37.50%
Process Manager	4	6.25%
Process Consultant	13	20.31%
Process Analyst	15	23.445
	64	
Years of process-related employment		
0-5 years	19	29.69%
6-10 years	35	54.69%
11-15 years	5	7.81%
15+ years	5	7.81%
	64	
Age Distribution		
20-30	9	14.06%
31-40	33	51.56%
41-50	12	18.75%
50+	10	15.63%
	64	
Gender		
Male	34	53.13%
Female	30	46.88%
Highest Qualification		
Grade 12 (St. 10)	5	7.81%
B-Degree/Diploma	38	59.38%
Honours	13	20.31%
Masters	8	12.50%
	64	

Of the seventy-five questionnaires sent out, sixty-four questionnaires were returned. All of the returned questionnaires were unspoiled and could be used. The number of responses (n=64) represented an eighty-five percent response rate.

The respondents represented the management/control side as well as the improvement side of the Business Process Management environment as identified by the researcher via the BPMCAM model and framework. A valid assumption can be made regarding the balanced representation of both the management (process administrator, process custodian and process manager = 56.25%) and improvement (process consultant and process analyst = 43.75%) areas regarding their viewpoint of the validity of the criteria and Critical Success Factors included in the BPMCAM.

The respondents are in general and regarding Business Process Management experience well qualified. More than 70% of the respondents have in excess of 6 years experience in the Business Process Management environment and more than 90% of respondents have a tertiary qualification.

The findings of Table 4.2 overleaf shows that all the criteria were considered by the respondents as being relevant to the Business Process Management environment. The criterion Corporate Strategy, although extremely relevant, was rated the lowest of all the criteria. This is expected as Business Process Management is currently still viewed as the "Reengineering of processes" and therefore the inclination by the more operational levels to perceive "Corporate Strategy" as "removed" from the "Process Management Operational" level.

The Critical Success Factor regarding "External Consultants" (Guiding Principle 19 in the Relevance Questionnaire Annexure "A") was rated by only 39 respondents as being relevant with a content validity of only 0.22. The rating to determine if the items included in the validity questionnaire on Business Process Management as a Critical Core Capability of an organization had a content validity ratio of more than 0.50 resulted in the following – The eleven (11) criteria (100%), the thirty (30) Critical Success Factors (100%), and the eighty eight (88) Guiding Principles (99%). This shows that the theoretical construct of the BPMCAM's framework and items are viewed as valid and thus acceptable to be used in an assessment tool. These responses answered the following research question:

What must be implemented, in terms of strategies, governance, enterprize architecture and process optimization, to ensure that organization culture, people's behavior and the work environment will be conducive to successfully establish and maintain Business Process Management as a Critical Core Capability of an organization?

Table 4.2 Content Validity of Business Process Management Criteria, Critical Success Factors and Guiding Principles as perceived by experts currently operating in the Business Process Management environment.

	Criteria and Critical Success Factors of Business Process Management (BPM) as a Critical Core Capability	N = Total number of Respondents (64) ne = Number of Respondents CVR = ne-N/2 CVR = Content Validity CVR > 50% or 0.50 are acceptable	
	What is the relevance of the following criteria with regard to contributing towards successful BPM within an organization?	**ne**	**CVR**
(C).A	**Corporate Strategy** (i.e. The way Top Management defines, cascades and reviews BPM strategy on a Corporate level).	60	0.88
(C).B	**Business Strategy** (i.e. The way the organization convert Corporate Strategy into Tactical and Operational BPM Business Plans).	62	0.94
(C).C	**Governance** (i.e. Define, monitor and control BPM governance policies and procedures).	63	0.97
(C).D	**Enterprize Architecture** (i.e. The engineering of the organization's infrastructure, business process model, information systems and technology applications).	62	0.94
(C).E	**Infrastructure** (i.e. The way the organization is structured to enable the management of business processes horizontally across business units).	63	0.97
(C).F	**Process Architecture** (i.e. The way the organization ensures that all stakeholders have one standard, one view and shared meaning on all business processes).	64	1.00
(C).G	**Systems & Information Architecture** (i.e. The way the organization's systems architecture incorporates and supports the BPM systems and processes).	62	0.94
(C).H	**Optimization** (i.e. The way the organization remains competitive through optimizing current business processes).	63	0.97
(C).I	**Process Improvement** (i.e. The way the organization utilizes resources and methodologies to improve business processes).	64	1.00
(C).J	**Process Review Cycle** (i.e. The way the organization ensure continuous improvement of business processes).	62	0.94

(C).K	**Process Standards & Measures** (i.e. The way the organization evaluates and assesses business processes against appropriate standards).	63	0.97

	What is the relevance of the following Guiding Principles with regard to the different criteria?	N = Total number of Respondents (64) ne = Number of Respondents CVR = ne-N/2	
(C).A	**Corporate Strategy**		
1	Management commitment to the development of BPM strategy must be visible.	62	0.94
2	The BPM strategic planning process must balance the needs and expectations of all stakeholders.	60	0.88
3	BPM strategy and supporting policies must regularly be reviewed, updated and improved.	62	0.94
4	There must be an enterprize-wide evaluation of people's awareness of the BPM strategy.	63	0.97
(C).B	Business Strategy		
1	The BPM strategy must be translated into strategic business plans in every business unit.	56	0.75
(C).C	Governance		
1	Compliance to BPM standards must be measured via formal assessment practices.	62	0.94
2	BPM governance rules must be defined and integrated into the enterprize governance process.	63	0.97
3	A formal reporting process must be in place supported by processes to rectify non-compliance.	61	0.91
(C).D	Enterprize Architecture		
1	The organization should have formal approved and maintained enterprize architecture in place.	63	0.97
(C).E	Infrastructure		
CSFE1	Organizational Structure	64	1.00
1	The organizational structure must enable the management of business processes horizontally across business units.	61	0.91
2	The organizational structure must clearly define roles and responsibilities as well as the placement of power.	61	0.91
3	The BPM organizational structure (centralized and decentralized) must be aligned with the organizations business model.	61	0.91

	What is the relevance of the following Guiding Principles with regard to the different criteria?	N = Total number of Respondents (64) ne = Number of Respondents CVR = ne-N/2	
CSFE2	Financial Management	60	0.88
4	Financial management regarding BPM should be well established and controlled on strategic and operational level.	59	0.84
CSFE3	Roles and Responsibilities	64	1.00
5	Essential BPM functions must be explicitly identified in the organization model, with clearly specified roles and responsibilities.	63	0.97
6	Owners of core processes must be formally assigned the responsibility as part of his/her critical performance areas.	63	0.97
7	Roles and responsibilities must be designed to empower BPM staff.	63	0.97
CSFE4	Management	63	0.97
8	Management must endorse, have control over, and display a hands-on responsibility and ownership of the Critical Success Factors of the BPM function.	62	0.94
9	Staff and Line management must act as champions of change initiated by the BPM functionality.	63	0.97
CSFE5	Steering Committees	63	0.97
10	Steering committees with decision-making capability must be active within all the major BPM initiatives.	63	0.97
11	Senior management must display their commitment to BPM initiatives through leadership roles within the steering committees.	62	0.94
CSFE6	Process Ownership and Custodianship	64	1.00
12	Process ownership and custodianship must be full-time dedicated positions with the major critical performance area being the management of end-to-end processes.	62	0.94
13	Process owners and custodians should be regarded as role models with in-depth knowledge and should be respected within the organization.	61	0.91
CSFE7	Business Process Analysts	64	1.00
14	Analysts should be competent to manage the total process improvement cycle and functions.	62	0.94

	What is the relevance of the following Guiding Principles with regard to the different criteria?	N = Total number of Respondents (64) ne = Number of Respondents CVR = ne-N/2	
15	Analysts should be full-time dedicated to process management and not part-time committed.	55	0.72
16	Analysts recommendations should be respected throughout the organization.	56	0.75
CSFE8	Project Teams	64	1.00
17	Cross-functional project teams with decision-making capability must be formed and utilized.	63	0.97
18	Cross-functional project teams should be properly trained in process improvement techniques to complement their subject matter expertise.	60	0.88
CSFE9	External Consultants	51	0.59
19	External consultants should be utilized to introduce new thoughts into BPM initiatives.	39	0.22
20	The organization should have the ability to capture and utilize the intelligence that external consultants bring.	51	0.59
CSFE10	Stakeholders	64	1.00
21	All business process stakeholders (internal and external) must actively be involved in business and process improvement initiatives.	63	0.97
22	Processes should be fully understood by all the stakeholders involved.	64	1.00
23	The organization's stakeholders' expectations should be included into improvement initiatives.	63	0.97
CSFE11	Policies, Procedures and Rules	64	1.00
24	Well-defined policies, procedures, rules and goal statements must be developed for every process.	64	1.00
25	There must be practical guidance on how to implement policies, procedures and rules.	64	1.00
26	Awareness, understanding and compliance to policies, procedures and rules must be measured.	62	0.94
CSFE12	People Management	64	1.00
27	A Human Resources Management plan for the BPM function must be in place supported by adequate funding.	63	0.97

	What is the relevance of the following Guiding Principles with regard to the different criteria?	N = Total number of Respondents (64) ne = Number of Respondents CVR = ne-N/2	
28	There must be consistency between the BPM Strategic plan and the BPM Human Resources Management plan.	62	0.94
29	BPM enterprize-wide succession plans must be in place to ensure continuous availability of the required quality and skilled staff.	64	1.00
CSFE13	Training	64	1.00
30	A comprehensive education and training strategy supported by detail training programs, focused on individual and corporate needs, must be in place.	63	0.97
31	Appropriate ongoing BPM training and career development must be performed to fulfil the needs of the BPM Human Resources Management plan.	63	0.97
32	The education and training programs must be supported by budgets, resources, facilities and dedicated trainers.	64	1.00
33	Training and education must be critical components of the employee's career path.	64	1.00
34	All BPM staff must initially and on a continuous basis be trained on all technical aspects of their work e.g. analysis, mapping, improvement techniques, etcetera.	63	0.97
CSFE14	Measurement of staff	64	1.00
35	Business process staff's performance must be measured against the business process performance as opposed to functional activities.	60	0.88
36	Performance and capabilities must be assessed and measured against agreed and contracted critical performance areas.	64	1.00
37	The controls needed for measurement of BPM staff must be in place at the point of accountability.	63	0.97
CSFE15	Communication	64	1.00
38	BPM communication must be channelled through and reviewed at a central point to ensure it includes all the information required.	62	0.94
39	There must be an inventory kept of all communication passed into the BPM system.	60	0.88

	What is the relevance of the following Guiding Principles with regard to the different criteria?	N = Total number of Respondents (64) ne = Number of Respondents CVR = ne-N/2	
40	There must be a control process in place to ensure that all participants received, acknowledged and adhered to communication passed into the BPM system.	60	0.88
(C).F	Process Architecture		
	Concept		
1	The concepts “end-to-end process” and “process architecture” must be accepted by all stakeholders.	64	1.00
CSFF1	Taxonomy	64	1.00
2	A process taxonomy or classification must be agreed and designed for the organization and all processes must be classified accordingly.	63	0.97
3	All process maps must be linked to the taxonomy to give an holistic view and sufficient details on all levels of the organization’s business processes in all areas.	63	0.97
4	Interfaces between the high-level processes and sub-processes must be clearly indicated in the taxonomy and on the maps.	63	0.97
CSFF2	Modeling/mapping	64	1.00
5	An agreed-upon process modeling methodology inclusive of types of models and format of models must be implemented and adhered to within the total organization.	63	0.97
CSFF3	Standards of process models	64	1.00
6	A standard framework for process maps, process-supporting documentation and procedures must be defined and monitored.	64	1.00
7	Standards for every attribute on the process map must be determined, documented and implemented.	64	1.00
8	Process maps must clearly indicate what functions the system must perform to enable the utilization of process maps when systems are built.	63	0.97
CSFF4	Quality control	64	1.00
9	Measurable quality standards regarding process maps and documentation must be clearly defined.	64	1.00

	What is the relevance of the following Guiding Principles with regard to the different criteria?	N = Total number of Respondents (64) ne = Number of Respondents CVR = ne-N/2	
10	Roles and responsibilities to manage the quality assurance processes and quality control procedures must be defined.	64	1.00
11	Quality education and training programs must be compulsory for all persons mapping processes – inclusive of external consultants utilized by the organization.	63	0.97
CSFF5	Change and version control	64	1.00
12	A well-controlled change control and version control process must be in place.	64	1.00
(C).G	Systems and Information Architecture		
CSFG1	Architecture	64	1.00
1	The organization must have a formal systems architecture that governs the entire enterprize information value chain.	63	0.97
2	The systems infrastructure must be designed to promote and share standards on business process documentation, technical documentation and training material between stakeholders.	63	0.97
3	There must be cooperation between BPM and Technology to ensure maximum benefit for the organization through the process management systems.	63	0.97
CSFG2	Modeling Tools	64	1.00
4	The organization must have an approved software modeling tool implemented enterprize-wide to ensure standardization and shared meaning.	64	1.00
5	The BPM team must be fully trained to use the mapping tool.	64	1.00
CSFG3	Process Automation	64	1.00
6	The automation of business process must form part of the organization's vision and current and future systems and process architecture.	64	1.00
CSFG4	Process Repository	64	1.00
7	A centralized process repository must be used to ensure one approved process view across all business units.	64	1.00
CSFG5	Links to other systems	60	0.88

	What is the relevance of the following Guiding Principles with regard to the different criteria?	N = Total number of Respondents (64) ne = Number of Respondents CVR = ne-N/2	
8	A systematic solution must be in place to link all business process-related systems.	59	0.84
CSFG6	Publishing of maps	64	1.00
9	All signed-off business processes must be published on an enterprize-wide public domain to allow read-only access to all stakeholders.	64	1.00
CSFG7	Change management control	64	1.00
10	A formal change management control system must be in place to track individual processes and to ensure that all process maps within the repository are current and up-to-date.	63	0.97
(C).H	Process Optimization		
1	The organization must have a process optimization vision and strategy in place as part of the BPM strategic plan.	64	1.00
(C).I	Process Improvement		
1	The improvement of processes must be a continuous and joint undertaking between BPM staff, process owners, business units, and other stakeholders.	64	1.00
2	Business process improvement must focus on end-to-end processes and overall process performance.	64	1.00
3	All stakeholders must continually focus on identification of process improvement opportunities.	63	0.97
4	Management attention must be focused on execution and sustainability of improvement programs.	64	1.00
CSF I1	Process Improvement models/approaches	64	1.00
5	The organization must adapt tested improvement models/approaches/ methodologies, supported by recognized process analysis- and improvement techniques to ensure scientific process improvement solutions.	59	0.84
CSF I2	Project Management principles	61	0.91
6	Process improvement initiatives must be performed according to Project Management principles to ensure a focus of resources and abilities towards the desired outcome.	61	0.91

	What is the relevance of the following Guiding Principles with regard to the different criteria?	N = Total number of Respondents (64) ne = Number of Respondents CVR = ne-N/2	
SCF I3	Risk Management	64	1.00
7	The management of risk (Organizational, process and project) must form an integral part of all BPM improvement initiatives.	64	1.00
(C).J	Process Review cycle		
8	The organization must have an overall process review program that manages the life cycle of improvement and optimization.	64	1.00
9	The individual business units and process owners must have a process review plan which focuses on causing significant continual improvements to processes.	63	0.97
10	The workforce must have the big picture regarding review of enterprize-wide core processes.	62	0.94
11	There must be an integrated work plan that enforces the review of proposed processes by stakeholders during the improvement phase.	64	1.00
12	All new process implementations must have a post-implementation assessment phase that will provide sufficient feedback on measurement aspects to management.	64	1.00
(C).K	Process Standards and Measures		
1	Performance standards and compliance principles must be determined and included in all stages of the business process.	64	1.00
2	The performance standards and responsibilities of stakeholders with regard to critical business processes must be well-communicated and clearly understood by stakeholders.	64	1.00
3	Measurements of process performance must involve all stakeholders and must be done on the end-to-end total quality of the process and must include financial, operational, customer, supplier and organizational criteria.	64	1.00
4	Measurement techniques must ensure alignment with enterprize-wide goals, and must be integrated with the organization's overall measurement tools such as the Balanced Scorecard.	63	0.97

	What is the relevance of the following Guiding Principles with regard to the different criteria?	N = Total number of Respondents (64) ne = Number of Respondents CVR = ne-N/2	
5	Through "As-Is" processes it must be identified where and how measurement should be performed, i.e. service level agreements etcetera.	64	1.00

4.2.2 BPMCAM Development – Scale Development

The valid criteria, Critical Success Factors, and Guiding Principles derived from the validity measurement above were used to compile a set of 93 items. These items were clustered according to seven criteria derived from the literature review and were included in a Scale Development questionnaire (See Annexure "B") that was forwarded to a sample group of process managers, process administrators, process custodians, process consultants, process analysts, work-study officers and other positions utilizing process management principles that are well educated and experienced in the Business Process Management field. The sample group is representative across different industrial sectors i.e. financial services, telecommunication, transport, government, manufacturing, social services, mining, etcetera.

The Biographical Information on the sample group is set out in Table 4.3. It is clear from the Biographical Information that the sample group is well educated, experienced and representative across a wide spectrum of qualifications, business units and industrial sectors.

Results and findings on the development of the BPMCAM have been reported sequentially as the tool was developed.

Table 4.3 Biographical Information on Expert Group – sample group (N = 313) (BPMCAM Development)

QUALIFICATION	TOTAL
Secondary school	0
Std. 10 or equivalent	6
Post-school certificate/diploma	15
National Diploma/National Higher Diploma	37
Bachelor's degree or equivalent	85
Honours degree or equivalent	88
Master's degree or equivalent	79
Doctoral degree or equivalent	3
POSITION	TOTAL
Management	33
Process Owner	14
Process Custodian	37
Process Administrator	17
Process Analyst	32

Work-study Officer	23
Consultant	38
IT Analyst	18
Business Analyst	31
General Management	17
Engineer	14
Administration	0
Financial	6
Project Management	16
Medical Related	1
Process Engineer	7
Scientist	1
Teacher/Lecturer	7
Compliance Officer	1
BUSINESS UNIT	
Administration	29
Finance	22
Procurement and Assets	10
Project Management	5
Mortgage	13
Production and Manufacturing	94
Sales and Customer Service	68
Human Resources	12
IT	25
Education	3
None (Business Unit not specified)	12
Communication	7
Research	5
Information Management	5
Compliance and Legal	3
ECONOMIC SECTOR	TOTAL
Transport, storage and communication	71
Financial, insurance, real estate and business services	130
Community, social and personal services	8
General government services	30
Manufacturing	73
GENDER	TOTAL
Male	211
Female	102

Years of process related employment (Mean)	10.3 years							
Age Group (Mean 39 years)	<25	26-30	31-35	36-40	41-45	46-50	51-55	>55
	4	36	73	83	51	37	19	10

4.2.2.1 Item Analysis

The initial 93 items (Annexure "B") developed by the researcher were divided into the following criteria based on the key areas covered by the model:

- Strategy formulation and governance of the Business Process Management function;
- Structure, roles, responsibilities, policies, procedures and people management for the Business Process Management function;
- The way the Business Process Management function creates a sustained way of managing and maintaining the "process architecture";
- The way the Business Process Management function creates a way of sustaining the "systems and information architecture";
- The way the organization remains competitive through optimizing and improving current business processes;
- The way the organization ensures continual improvement of business processes; and
- The way the organization evaluates and assesses business processes against appropriate standards.

Each of the seven criteria was subject to item analysis using the Conventional Item and Test Analysis Program (ITEMAN version 3.6). Table 4.4 shows the number of items within the seven identified criteria. Tables 4.5 to 4.11 show the specific item analysis per dimension. Table 4.12 shows the descriptive statistics for the seven criteria. Table 4.13 shows the Scale inter-correlation between the criteria.

A total of 374 questionnaires were sent to an identified population via e-mail. A total of 319 anonymous question-naires were received back of which six questionnaires were spoiled and 313 questionnaires were utilized.

Table 4.4 Number of items within the seven identified criteria

CRITERIA	NUMBER OF ITEMS
Strategy formulation and governance "A"	8
Structure, roles, responsibilities, policies, procedures and people management "B"	43
The way the BPM function creates a sustained way of managing and maintaining the "process architecture" "C"	12
The way the BPM function creates a sustained way of managing and maintaining the "systems and information architecture" "D"	11

CRITERIA	NUMBER OF ITEMS
The way the organization remains competitive through optimizing and improving current business processes "E"	8
The way the organization ensures continual improvement of business processes "F"	5
The way the organization evaluates and assesses business processes against appropriate standards "G"	6
Total number of items =	93
N of Respondents =	313

Table 4.5 Item Analysis per "Strategy formulation and governance" – Criterion "A"

Item	Scale item	Item mean	Item Var.	Item-scale correlation	N per item
1	1-1	4.827	0.143	.38	313
2	1-2	4.514	0.333	.64	313
3	1-3	4.681	0.217	.62	313
4	1-4	4.578	0.314	.61	313
5	1-5	4.585	0.313	.60	313
6	1-6	4.626	0.272	.62	313
7	1-7	4.629	0.272	.63	313
8	1-8	4.530	0.262	.56	313

No item had a total item correlation of ≤ 0.32 and all items were subjected to Factor Analysis.

Table 4.6 Item Analysis per "Structure, roles, responsibilities, policies, procedures and people management" – Criterion "B"

Item	Scale item	Item mean	Item Var.	Item-scale correlation	N per item
9	2-1	4.511	0.314	.56	313
10	2-2	4.473	0.288	.45	313
11	2-3	4.610	0.257	.45	313
12	2-4	4.390	0.302	.37	313
13	2-5	4.716	0.210	.45	313
14	2-6	4.770	0.190	.47	313
15	2-7	4.594	0.305	.49	313
16	2-8	4.546	0.254	.42	313
17	2-9	4.594	0.279	.47	313
18	2-10	4.550	0.286	.50	313
19	2-11	4.663	0.239	.51	313
20	2-12	4.476	0.364	.40	313
21	2-13	4.626	0.292	.38	313

Item	Scale item	Item mean	Item Var.	Item-scale correlation	N per item
22	2-14	4.719	0.317	.39	313
23	2-15	4.594	0.279	.45	313
24	2-16	4.489	0.275	.43	313
25	2-17	4.623	0.318	.42	313
26	2-18	4.403	0.285	.43	313
27	2-19	4.412	0.306	.62	313
28	2-20	4.534	0.294	.57	313
29	2-21	4.182	0.417	.34	313
30	2-22	4.393	0.264	.55	313
31	2-23	4.505	0.263	.49	313
32	2-24	4.323	0.276	.52	313
33	2-25	4.620	0.306	.49	313
34	2-26	4.489	0.256	.44	313
35	2-27	4.537	0.255	.48	313
36	2-28	4.422	0.295	.57	313
37	2-29	4.265	0.412	.53	313
38	2-30	4.508	0.301	.53	313
39	2-31	4.546	0.273	.52	313
40	2-32	4.479	0.288	.49	313
41	2-33	4.428	0.270	.48	313
42	3-34	4.326	0.437	.53	313
43	2-35	4.508	0.282	.55	313
44	2-36	4.617	0.294	.36	313
45	2-37	4.281	0.579	.42	313
46	2-38	4.594	0.260	.54	313
47	2-39	4.518	0.320	.46	313
48	2-40	4.355	0.286	.53	313
49	2-41	4.310	0.310	.54	313
50	2-42	4.278	0.348	.54	313
51	2-43	4.419	0.314	.62	313

No item had a total item correlation of ≤ 0.32 and all items were subjected to Factor Analysis.

Table 4.7 Item Analysis per "Managing and maintaining the process architecture" – Criterion "C"

Item	Scale item	Item mean	Item Var.	Item-scale correlation	N per item
52	3-1	4.466	0.281	.54	313
53	3-2	4.578	0.263	.67	313
54	3-3	4.655	0.258	.57	313
55	3-4	4.438	0.297	.51	313
56	3-5	4.585	0.268	.35	313
57	3-6	4.744	0.190	.46	313

Item	Scale item	Item mean	Item Var.	Item-scale correlation	N per item
58	3-7	4.505	0.327	.68	313
59	3-8	4.482	0.384	.62	313
60	3-9	4.591	0.248	.68	313
61	3-10	4.482	0.262	.63	313
62	3-11	4.588	0.428	.59	313
63	3-12	4.783	0.170	.56	313

No item had a total item correlation of ≤ 0.32 and all items were subjected to Factor Analysis.

Table 4.8 Item Analysis per "Managing and maintaining the systems and information architecture" – Criterion "D"

Item	Scale item	Item mean	Item Var.	Item-scale correlation	N per item
64	4-1	4.578	0.263	.52	313
65	4-2	4.550	0.260	.68	313
66	4-3	4.473	0.307	.61	313
67	4-4	4.508	0.288	.58	313
68	4-5	4.607	0.239	.54	313
69	4-6	4.591	0.267	.44	313
70	4-7	4.617	0.275	.47	313
71	4-8	4.489	0.307	.50	313
72	4-9	4.709	0.213	.59	313
73	4-10	4.390	0.327	.58	313
74	4-11	4.626	0.317	.53	313

No item had a total item correlation of ≤ 0.32 and all items were subjected to Factor Analysis.

Table 4.9 Item Analysis per "Optimization and improvement of current business processes" – Criterion "E"

Item	Scale item	Item mean	Item Var.	Item-scale correlation	N per item
75	5-1	4.613	0.250	.65	313
76	5-2	4.597	0.260	.50	313
77	5-3	4.671	0.246	.59	313
78	5-4	4.489	0.320	.48	313
79	5-5	4.591	0.286	.64	313
80	5-6	4.524	0.313	.58	313
81	5-7	4.518	0.326	.57	313
82	5-8	4.556	0.298	.68	313

No item had a total item correlation of ≤ 0.32 and all items were subjected to Factor Analysis.

Table 4.10 Item Analysis per "Continuous improvement of business processes" – Criterion "F"

Item	Scale item	Item mean	Item Var.	Item-scale correlation	N per item
83	6-1	4.518	0.269	.76	313
84	6-2	4.581	0.263	.65	313
85	6-3	4.428	0.322	.57	313
86	6-4	4.569	0.277	.67	313
87	6-5	4.629	0.233	.64	313

No item had a total item correlation of ≤ 0.32 and all items were subjected to Factor Analysis.

Table 4.11 Item Analysis per "Assessment of business processes against appropriate standards" – Criterion "G"

Item	Scale item	Item mean	Item Var.	Item-scale correlation	N per item
88	7-1	4.537	0.287	.77	313
89	7-2	4.581	0.243	.71	313
90	7-3	4.511	0.352	.59	313
91	7-4	4.636	0.244	.56	313
92	7-5	4.556	0.266	.76	313
93	7-6	4.524	0.275	.70	313

No item had a total item correlation of ≤ 0.32 and all items were subjected to Factor Analysis.

Table 4.12 Descriptive scale statistics for Business Process Management overall

Scale	1	2	3	4	5	6	7
N of items	8	43	12	11	8	5	6
Mean score	4.621	4.492	4.575	4.558	4.570	4.545	4.558
Variance	0.091	0.069	0.092	0.083	0.099	0.118	0.129
Std. Dev.	0.302	0.263	0.303	0.289	0.314	0.343	0.359
Skew (Sk)	-0.544	-0.394	-0.722	-0.439	-0.717	-0.376	-0.540
Kurtosis (Ku)	-0.475	-0.089	0.029	-0.521	0.197	-0.765	-0.399
Cronbach Alpha Coefficient	0.727	0.920	0.813	0.766	0.727	0.670	0.769

Overall reliability of the items per criteria is highly acceptable with a Cronbach Alpha Coefficient of respectively 0.727, 0.920, 0.813, 0.766, 0.727 and 0.769 except for criterion 6 with a Cronbach Alpha Coefficient of 0.670.

Table 4.13 Scale inter-correlation between criteria

Scale	1	2	3	4	5	6	7
1	1.000	0.773	0.584	0.606	0.655	0.580	0.602
2	0.773	1.000	0.749	0.800	0.802	0.723	0.709
3	0.584	0.749	1.000	0.727	0.690	0.607	0.539
4	0.606	0.800	0.727	1.000	0.748	0.639	0.652
5	0.655	0.802	0.690	0.748	1.000	0.695	0.724
6	0.580	0.723	0.607	0.639	0.695	1.000	0.718
7	0.602	0.709	0.539	0.652	0.724	0.718	1.000

The item inter-correlation was high – which is expected of a model that is supposed to be highly inter-dependent and systemic in nature.

This concludes the discussion on the results from the item analysis – no item had a total correlation of ≤ 0.32.

4.2.2.2 Factor Analysis

The researcher from the onset clustered the 93 items in seven distinct criteria consisting of items measuring the specific criteria. The aim of the measurement instrument and the clustering of items under defined criteria is two-fold, i.e. to obtain an overall view of the status and health of Business Process Management within a specific organization or business unit and to identify strengths and weaknesses within the specific criteria. This will enable the organization or business units to immediately exert direct focus on the critical criteria or to capitalize on criteria with a high success percentage.

Although the intent throughout the development was for the measurement instrument to perform the Item and Factor Analysis on the instrument, and later within organizations, according to the predetermined criteria the researcher for completeness and comprehensiveness performed additional Factor Analysis on the total item set of 93 items irrespective of criteria clustering.

In the determining of the number of factors the following criteria were used. A Scree test to determine the number of factors with Kaiser's Eigenvalues higher than 1.00. The factors were chosen based on the results of the Scree test, the percentage variance as well as the Cronbach Alpha Coefficient. The factors were subject to further Factor Analysis. The rotated sorted analysis results were utilized to analyze the factor loadings. Variables with factor loadings ≤ 0.30 were eliminated within the premise (loadings 0.30 – 0.60 = moderate and loadings 0.60 – 1.00 = high).

According to the University of Texas at Austin Statistical Services, (1995) "a rule of thumb frequently used is that factor loadings greater than 0.30 in absolute value are considered to be significant. This criterion is just a guideline and may need to be adjusted. As the sample size and the number of variables increase or decrease, the criteria may need to be adjusted slightly."

Finally the researcher, in terms of the University of Texas at Austin Statistical Services (1995) guidelines, "assessed the factors extracted according to the interpretability of the results, as factor

solutions should be evaluated not only according to empirical criteria but also according to the criteria of 'theoretical meaningfulness'." The researcher is of the opinion that in the case of the criteria an interpretable one- or two-factor solution is more useful than a less interpretable five- or seven-factor solution with a better goodness-of-fit statistic as resulted in the analysis on the total item set of 93 items. The researcher further maintains that where the elimination of an item with a factor loading lower than 0.30 would impact the validity of the model negatively, the item should be retained.

The final assessment model was therefore compiled based on the results of the analysis performed on the individual criteria.

4.2.2.2.1 Factor Analysis on total items set of 93 Items

The 93 items were subjected to EFA with Direct Quartimin rotation within the BMDP Statistical Software (1993). The results per analysis as reported in this section were derived.

Based on the results of the first analysis (93 items and 7 factors), stretching it to the limit, one might argue that a secondary elbow occurred at the third- or even only at the eight-factor, implying a stronger two-factor or a more moderate seven-factor solution.

Although the dominant one-factor was ever-present in every analysis, a seven-factor or even a five- or three-factor solution is more interesting and meaningful than a single factor solution to investigate the hierarchical structure of the model. The results presented in tables 4.14 to 4.25 are based on a seven-factor, five-factor, three-factor and one-factor solution, which was obtained by repeating the analysis.

Analysis of: 93 items on seven factors for total item set of 93 items (Tables 4.14 to 4.15)

Although the Scree test identified 23 items with Kaiser's Eigenvalues higher than 1.00 and a Cronbach Alpha Coefficient for all the variables of 0.9638, it was clear that the Scree plot suggested the presence of a general factor as predicted from the correlation matrix. A large first Eigenvalue (22.2069) and a much smaller second Eigenvalue (3.67606) suggest the presence of a dominant factor.

Although three factors had a Cronbach Alpha Coefficient lower than 0.70 and several factors had less than 10 items with loadings higher than 0.30, the researcher decided to eliminate the items with loadings lower than 0.30 and to repeat a seven-factor analysis (See Tables 4.16 to 4.17).

Table 4.14 Eigenvalues and % variance for 93 items (N = 313)

Factor	Eigenvalue	% Variance	Variance in Data Space
1	22.2069	21.5919	0.2322
2	3.67606	3.0516	0.2650
3	2.97920	2.3718	0.2905
4	2.74221	2.1148	0.3132
5	2.60073	1.9742	0.3345
6	2.49245	1.8841	0.3547
7	2.22349	1.6135	0.3721
8	2.09051		
9	2.05345		
10	1.95333 etc.		

Table 4.15 Sorted rotated factor loadings on 93 items on seven factors for all 93 items (N = 313)

Item	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7
F84	**0.535**	0.260	0.000	0.000	0.000	0.000	0.000
G8	**0.525**	0.000	0.000	0.000	0.000	0.000	0.000
B35	**0.507**	0.000	0.000	0.000	0.340	0.000	0.000
B51	**0.504**	0.000	0.000	0.000	0.000	0.000	0.000
A3	0.000	**0.556**	0.000	0.000	0.000	0.000	0.000
B43	0.000	**0.524**	0.000	0.000	0.000	0.000	0.000
D72	0.000	0.000	**0.617**	0.000	0.000	0.000	0.000
B14	0.000	0.000	**0.594**	0.000	0.000	0.000	0.000
D70	0.000	0.000	**0.537**	0.000	0.000	0.000	0.000
C62	0.000	0.000	**0.523**	0.000	0.000	0.000	0.000
C55	0.000	0.000	0.000	0.000	**0.528**	0.000	0.000
C58	0.000	0.000	0.000	0.000	**0.508**	0.000	0.000
B49	0.275	0.000	0.000	0.000	0.000	**0.524**	0.000
B47	0.000	0.000	0.000	0.000	0.000	0.000	**0.617**
B34	0.000	0.000	0.000	0.000	0.000	0.000	**0.541**
B23	0.000	0.000	0.000	0.000	0.332	0.000	**0.477**
A8	0.000	0.000	0.000	0.000	0.000	0.000	**0.358**
B32	0.000	0.000	0.000	0.000	0.000	0.000	**0.357**
B10	0.000	**0.360**	0.000	0.000	0.000	0.000	0.329
B24	0.000	0.000	0.000	0.000	0.000	**0.333**	0.329
F87	0.305	0.000	0.000	0.000	0.000	0.000	**0.328**
B19	0.000	0.000	0.000	**0.350**	0.000	0.000	0.300
B25	0.000	0.000	**0.388**	0.000	0.000	0.000	0.288
B28	0.000	0.000	0.000	0.000	0.000	0.000	**0.284**
C53	0.000	0.000	0.000	0.000	**0.330**	0.000	0.283
B40	0.000	0.000	0.000	0.000	0.000	**0.337**	0.268

Item	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7
B31	**0.379**	0.000	0.270	0.000	-0.259	0.000	0.264
F83	0.260	0.000	0.000	0.000	0.000	**0.290**	0.262
B33	0.000	**0.453**	0.000	0.000	0.000	0.000	-0.261
B26	0.000	0.000	0.000	0.000	0.000	0.000	**0.259**
C61	**0.336**	0.000	0.000	0.000	0.000	0.000	0.253
D67	0.000	0.000	0.000	0.000	0.000	0.000	0.000
C60	0.000	**0.369**	0.000	0.000	0.000	0.000	0.000
B11	0.000	**0.433**	0.000	0.308	0.000	0.000	0.000
E82	0.270	0.000	0.000	**0.346**	0.000	0.000	0.000
A7	0.000	**0.453**	0.000	0.000	0.000	0.000	0.000
B46	**0.364**	0.000	0.000	0.000	0.000	0.000	0.000
D68	0.000	0.000	0.000	0.000	**0.363**	0.000	0.000
B13	0.000	0.000	0.000	0.000	0.000	0.000	0.000
B45	0.000	0.000	0.000	0.000	**0.488**	0.000	0.000
B44	0.000	0.000	0.000	0.000	0.000	**0.253**	0.000
G88	**0.480**	0.000	0.000	0.000	0.000	0.000	0.000
D74	0.000	0.000	**0.348**	0.000	0.000	0.279	0.000
D64	0.000	-0.283	0.000	0.000	0.000	**0.296**	0.000
E80	0.000	0.000	0.000	0.000	0.000	**0.425**	0.000
B17	0.000	**0.465**	0.000	0.000	0.000	0.000	0.000
E78	0.000	0.000	0.000	0.000	0.000	**0.279**	0.000
D71	0.000	0.000	0.000	**0.337**	0.000	0.000	0.000
B15	0.000	0.000	0.000	**0.457**	0.000	0.000	0.000
E76	**0.351**	-0.389	0.000	0.000	0.000	0.000	0.000
B9	0.000	0.000	0.000	**0.352**	0.000	0.000	0.000
C56	0.000	0.000	0.000	0.000	0.000	0.000	0.000
B16	**0.446**	0.000	0.000	0.251	0.000	0.000	0.000
B42	0.000	0.000	0.000	**0.375**	0.000	0.000	0.000
A5	**0.277**	0.000	0.000	0.000	0.000	0.000	0.000
D69	0.000	0.000	0.000	0.000	0.000	**0.495**	0.000
D65	**0.313**	0.000	0.000	0.295	0.000	0.000	0.000
F86	**0.418**	0.000	0.000	0.000	0.000	0.271	0.000
D66	0.000	0.000	0.000	**0.361**	0.000	0.272	0.000
E81	0.000	0.000	0.000	0.000	**0.453**	0.000	0.000
B18	**0.274**	0.000	0.000	0.000	0.000	0.000	0.000
G92	**0.392**	0.000	0.000	0.000	0.000	0.000	0.000
B27	0.000	0.000	0.000	**0.334**	0.301	0.000	0.000
B48	0.000	**0.406**	0.000	0.000	0.000	0.000	0.000
E79	0.318	0.000	0.000	0.000	**0.347**	0.000	0.000
A2	0.300	0.000	0.000	**0.463**	0.000	0.000	0.000
G91	0.000	**0.251**	0.000	0.000	0.000	0.000	0.000
C63	0.000	0.000	**0.472**	0.000	0.293	-0.393	0.000

Item	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7
E77	0.000	0.000	0.000	0.267	**0.355**	0.000	0.000
B22	0.000	0.000	**0.435**	0.000	0.000	0.000	0.000
G90	0.000	0.000	0.000	0.000	0.000	**0.350**	0.000
A1	0.000	**0.377**	0.000	0.000	0.000	0.000	0.000
B12	0.000	0.000	0.000	**0.346**	0.000	0.000	0.000
A6	0.000	0.258	**0.263**	0.000	0.000	0.000	0.000
C59	0.000	0.000	0.000	**0.450**	0.252	0.000	0.000
B41	0.000	0.000	0.000	**0.404**	0.000	0.000	0.000
B36	0.000	0.000	0.000	0.289	0.000	**0.499**	0.000
B21	0.000	**0.417**	0.000	0.000	0.000	0.000	0.000
C54	0.000	0.000	0.000	0.000	0.269	**0.273**	0.000
F85	0.000	0.000	0.000	0.000	**0.258**	0.000	0.000
B20	0.000	**0.473**	0.000	0.000	0.000	0.000	0.000
D73	0.000	0.000	0.000	**0.412**	0.000	0.000	0.000
B30	**0.318**	0.000	0.000	0.000	0.000	0.000	0.000
C52	0.255	0.000	0.000	0.000	**0.428**	0.000	0.000
C57	0.000	0.000	**0.434**	0.000	0.000	0.000	0.000
B39	0.000	0.000	**0.351**	0.000	0.000	0.261	0.000
B50	0.000	0.000	0.000	0.268	0.000	**0.348**	0.000
B37	0.000	**0.262**	0.000	0.000	0.000	0.258	0.000
B29	0.000	0.000	0.000	0.000	0.000	0.000	0.000
B38	0.000	0.000	0.000	**0.301**	0.000	0.262	0.000
A4	**0.278**	0.267	0.000	0.000	0.000	0.000	0.000
G93	**0.392**	-0.253	0.286	0.000	0.000	0.349	0.000
E75	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cronbach Alpha Coefficient	0.8194	0.8013	0.7599	0.6474	0.6749	0.7355	0.6577
Accounted % of Variance	18.5395%	2.7795%	2.1693%	1.8619%	1.7685%	1.7562%	1.5129%
	15	12	10	14	9	8	6

Analysis of: 73 items on seven factors for total item set of 93 items (Tables 4.16 to 4.17)

The Scree test identified 19 items with Kaiser's Eigenvalues higher than 1.00 and a Cronbach Alpha Coefficient for all the variables of 0.9586 and it was clear that the Scree plot still suggested the presence of a general factor as predicted from the correlation matrix. A large first Eigenvalue (19.1356) and a much smaller second Eigenvalue (3.39187) still suggest the presence of a dominant factor.

Although three factors had a Cronbach Alpha Coefficient lower than 0.70 the factors had a much more even spread of items with loadings higher than 0.30. The researcher decided to eliminate the items with loadings lower than 0.30 and to repeat a seven-factor analysis (See Tables 4.18 to 4.19).

Table 4.16 Eigenvalues and % variance for 73 items (N = 313)

Factor	Eigenvalue	% Variance	Variance in Data Space
1	19.1356	18.5395	0.2408
2	3.39187	2.7795	0.2769
3	2.75349	2.1693	0.3050
4	2.47145	1.8619	0.3292
5	2.39567	1.7685	0.3522
6	2.34401	1.7562	0.3750
7	2.10155	1.5129	0.3946
8	1.85352		
9	1.74562		
10	1.60103		
	etcetera		

Table 4.17 Sorted rotated factor loadings on 73 items on 7 factors (N = 313)

Item	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7
G88	**0.546**	0.000	0.000	0.000	0.000	0.000	0.000
B51	**0.540**	0.000	0.000	0.000	0.000	0.000	0.000
G89	**0.538**	0.000	0.000	0.000	0.000	0.000	0.000
F84	**0.529**	0.255	0.000	0.000	0.000	0.000	0.000
A3	0.000	**0.584**	0.000	0.000	0.000	0.000	0.000
B43	0.000	**0.521**	0.000	0.000	0.000	0.000	0.000
B20	0.000	**0.516**	0.000	0.000	0.000	0.000	0.000
D70	0.000	0.000	**0.582**	0.000	0.000	0.000	0.000
D72	0.000	0.000	**0.576**	0.000	0.000	0.000	0.000
B14	0.000	0.000	**0.554**	0.000	0.000	0.000	0.000
C62	0.000	0.000	**0.534**	0.000	0.000	0.000	0.000
C55	0.000	0.000	0.000	0.000	**0.544**	0.000	0.000
B45	0.000	0.000	0.000	0.000	**0.502**	0.000	0.000
B36	0.000	0.000	0.000	0.000	0.000	**0.571**	0.000
B47	0.000	0.000	0.000	0.000	0.000	0.000	**0.492**
B34	0.000	0.000	0.000	0.000	0.000	0.000	**0.478**
B23	0.000	0.000	0.000	0.000	0.418	-0.271	**0.430**
B32	0.000	0.000	0.000	0.000	0.000	0.000	**0.383**
B10	0.000	0.362	0.000	0.000	0.000	0.000	**0.381**
A8	0.000	0.000	0.000	0.000	0.000	0.000	**0.355**
B24	0.000	0.000	0.000	0.000	0.000	0.335	**0.352**
B19	0.000	0.000	0.000	**0.338**	0.000	0.000	0.334
B40	0.000	0.000	0.000	0.000	0.000	**0.330**	0.322
B25	0.000	0.000	**0.353**	0.000	0.000	0.000	-0.302
B33	0.000	**0.476**	0.000	0.000	0.000	0.000	-0.268
C53	0.000	0.000	0.000	0.000	**0.369**	0.000	0.000

Item	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7
C61	**0.360**	0.000	0.000	0.000	0.294	0.000	0.000
F87	**0.363**	0.000	0.000	0.000	0.000	0.000	0.000
B31	**0.388**	0.000	0.000	0.000	0.000	0.000	0.000
A7	0.000	**0.435**	0.000	0.000	0.000	0.000	0.000
C63	0.000	0.000	0.363	**0.373**	0.000	-0.347	0.000
B11	0.000	**0.442**	0.000	0.280	0.000	0.258	0.000
E80	0.281	0.000	0.000	0.000	0.000	**0.372**	0.000
B46	**0.347**	0.000	0.000	0.000	0.000	0.000	0.000
D74	0.000	0.000	**0.387**	0.000	0.000	0.000	0.000
B15	0.000	0.000	0.000	**0.376**	0.000	0.000	0.000
B42	0.000	0.000	0.000	**0.286**	0.000	0.285	0.000
C60	0.000	**0.384**	0.000	0.000	0.000	0.000	0.000
D66	0.000	0.000	0.000	0.000	0.000	**0.389**	0.000
C58	0.000	0.000	0.000	0.273	**0.479**	0.000	0.000
D69	0.000	0.000	0.000	-0.267	0.000	**0.447**	0.000
B9	0.000	0.000	0.000	0.000	0.000	0.000	0.000
E82	0.275	0.000	0.000	**0.389**	0.000	0.000	0.000
D71	0.000	0.000	0.000	0.000	0.000	**0.396**	0.000
D68	0.000	0.000	0.000	0.277	**0.319**	0.000	0.000
A1	0.000	**0.428**	0.000	0.000	0.000	0.000	0.000
B17	0.000	**0.460**	0.000	0.000	0.000	0.000	0.000
A2	0.000	0.000	0.000	**0.487**	0.000	0.000	0.000
E77	0.000	0.000	0.000	0.294	**0.321**	0.000	0.000
B22	0.000	0.000	**0.412**	0.000	0.000	0.000	0.000
B48	0.000	**0.391**	0.000	0.000	0.000	0.000	0.000
B12	0.000	0.000	0.000	**0.367**	0.000	0.000	0.000
C57	0.000	0.000	**0.361**	0.000	0.000	0.000	0.000
E81	0.000	0.000	0.000	0.000	**0.465**	0.000	0.000
G90	0.000	0.000	0.000	0.000	0.261	**0.330**	0.000
C59	0.000	0.000	0.253	**0.402**	0.000	0.000	0.000
E76	**0.379**	-0.332	0.000	0.000	0.000	0.000	0.000
B30	**0.283**	0.000	0.000	0.000	0.000	0.000	0.000
F86	**0.498**	0.000	0.000	0.000	0.000	0.000	0.000
D65	0.319	0.000	0.000	**0.340**	0.000	0.000	0.000
B16	**0.419**	0.000	0.000	0.000	0.328	0.000	0.000
B35	**0.442**	0.000	0.000	0.000	0.362	0.000	0.000
G92	**0.459**	0.000	0.000	0.000	0.000	0.000	0.000
B21	0.000	**0.466**	0.000	0.000	0.000	0.000	0.000
B38	0.000	0.000	0.000	0.000	0.000	**0.363**	0.000
B41	0.000	0.000	0.000	**0.365**	0.000	0.000	0.000
E79	0.267	0.000	0.000	0.293	**0.308**	0.000	0.000
B49	0.405	0.000	0.000	0.000	0.000	**0.435**	0.000

Item	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7
B39	0.000	0.000	**0.381**	0.000	0.000	0.257	0.000
D73	0.000	0.000	0.000	**0.433**	0.000	0.000	0.000
C52	0.000	0.000	0.000	0.000	**0.470**	0.000	0.000
G93	**0.468**	0.271	0.310	0.000	0.000	0.260	0.000
B50	0.000	0.000	0.000	0.000	0.000	**0.401**	0.000
	17	11	9	10	9	9	7
Cronbach Alpha Coefficient	0.8194	0.8013	0.7599	0.6474	0.6749	0.7355	0.6577
Accounted % of Variance	18.5395%	2.7795%	2.1693%	1.8619%	1.7685%	1.7562%	1.5129%

Analysis of: 67 items on seven factors for total item set of 93 items (Tables 4.18 to 4.19)

The Scree test identified 18 items with Kaiser's Eigenvalues higher than 1.00 and a Cronbach Alpha Coefficient for all the variables of 0.9528 and it was clear that the Scree plot still suggested the presence of a general factor as predicted from the correlation matrix. A large first Eigenvalue (16.8560) and a much smaller second Eigenvalue (3.29931) still suggest the presence of a dominant factor.

Two factors had a Cronbach Alpha Coefficient lower than 0.70 and three factors had seven or less items with loadings higher than 0.30. The researcher decided to eliminate the items with loadings lower than 0.30 and to perform a five-factor analysis – as a result of the low Cronbach Alpha Coefficients (See Tables 4.20 to 4.21).

Table 4.18 Eigenvalues and % variance for 67 items (N = 313)

Factor	Eigenvalue	% Variance	Variance in Data Space
1	16.8560	16.2618	0.2357
2	3.29931	2.6830	0.2746
3	2.58556	1.9853	0.3033
4	2.40709	1.8183	0.3297
5	2.27846	1.6733	0.3539
6	2.24195	1.6457	0.3778
7	1.84031	1.2232	0.3955
8	1.70662		
9	Etc.		
10			

Table 4.19 Sorted rotated factor loadings on 67 items on 7 factors (N = 313)

Item	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7
F86	**0.617**	0.000	0.000	0.000	0.000	0.000	0.000
B35	**0.569**	0.000	0.000	0.000	0.000	0.000	0.000
G88	**0.537**	0.000	0.000	0.000	0.000	0.000	0.000
F84	**0.517**	0.000	0.000	0.000	0.000	0.000	0.000

Item	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7
B51	**0.509**	0.000	0.000	0.000	0.000	0.000	0.000
A3	0.000	**0.624**	0.000	0.000	0.000	0.000	0.000
B43	0.000	**0.534**	0.000	0.000	0.000	0.000	0.000
B20	0.000	**0.501**	0.000	0.000	0.000	0.000	0.000
C58	0.000	0.000	**0.560**	0.000	0.000	0.000	0.000
B45	0.000	0.000	**0.515**	0.000	0.000	0.000	0.000
D70	0.000	0.000	0.000	**0.601**	0.000	0.000	0.000
D72	0.262	0.000	0.000	**0.529**	0.000	0.000	0.000
C62	0.000	0.000	0.280	**0.511**	0.000	0.000	0.000
B36	0.000	0.000	0.000	0.000	0.000	**0.553**	0.000
B47	0.000	0.000	0.000	0.000	0.000	0.000	**0.645**
F87	0.266	0.000	0.300	0.000	0.000	0.000	**0.458**
A8	0.000	0.000	0.000	0.000	0.000	0.000	**0.428**
B34	0.000	0.000	0.000	0.000	0.000	0.000	**0.379**
B25	0.000	0.000	0.000	**0.274**	0.000	0.000	-0.370
E82	0.000	0.000	0.274	0.000	**0.341**	0.000	0.312
B24	0.000	0.000	0.000	0.000	0.000	**0.343**	0.308
B32	0.000	0.000	0.000	0.000	0.000	0.000	**0.295**
B33	0.000	**0.407**	0.000	0.000	0.000	0.000	-0.289
B40	0.000	0.000	0.000	0.254	0.000	**0.366**	0.285
B19	0.000	0.000	0.000	0.000	**0.360**	0.000	0.273
C53	0.000	0.000	**0.408**	0.000	0.000	0.000	0.000
B15	0.000	0.000	0.000	0.000	**0.307**	0.000	0.000
D74	0.000	0.000	0.000	**0.438**	0.000	0.000	0.000
C61	**0.399**	0.000	0.000	0.000	0.000	0.000	0.000
B10	0.000	**0.429**	0.000	0.000	0.000	0.000	0.000
B16	**0.341**	0.000	0.000	0.000	0.309	0.000	0.000
G89	**0.497**	0.000	0.000	0.000	0.314	0.000	0.000
C60	0.000	**0.373**	0.319	0.000	0.000	0.000	0.000
B46	**0.368**	0.000	0.000	0.000	0.000	0.000	0.000
G92	**0.409**	0.000	0.000	0.000	0.000	0.000	0.000
E80	0.254	0.000	0.000	0.000	0.000	**0.387**	0.000
B11	0.000	**0.367**	0.000	0.000	0.000	0.000	0.000
G90	0.000	0.000	0.252	0.000	0.000	**0.282**	0.000
C57	0.000	0.000	0.000	**0.298**	0.000	0.000	0.000
B48	0.000	**0.380**	0.000	0.000	0.000	0.286	0.000
B31	**0.390**	0.256	-0.339	0.000	0.000	0.000	0.000
D66	0.000	0.000	0.000	0.000	0.000	**0.427**	0.000
A7	0.000	**0.416**	0.000	0.000	0.000	0.000	0.000
C52	**0.369**	0.000	0.000	0.000	0.000	0.000	0.000
B22	0.000	0.000	0.296	**0.316**	0.000	0.000	0.000
G93	**0.432**	-0.306	0.000	0.304	0.000	0.000	0.000
E81	0.000	0.000	**0.402**	0.000	0.000	0.000	0.000
C63	0.000	0.000	0.313	0.326	**0.414**	-0.410	0.000

Item	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7
E76	**0.362**	-0.313	0.000	0.000	0.000	0.000	0.000
D68	0.000	0.000	0.000	0.000	**0.272**	0.000	0.000
B17	0.000	**0.452**	0.000	0.000	0.000	0.000	0.000
D71	0.000	0.000	0.304	0.000	0.000	**0.401**	0.000
A2	0.000	0.000	0.000	0.000	**0.477**	0.000	0.000
D69	0.000	0.000	0.266	0.000	-0.297	**0.357**	0.000
B50	0.000	0.000	0.000	0.000	0.000	**0.488**	0.000
B38	0.000	0.000	0.000	0.000	0.000	**0.443**	0.000
E77	0.000	0.000	**0.443**	0.000	0.000	0.000	0.000
B41	0.000	0.000	0.000	0.000	**0.344**	0.000	0.000
C59	0.000	0.000	0.000	0.000	**0.411**	0.000	0.000
B12	0.000	0.000	0.000	0.000	**0.411**	0.000	0.000
B14	0.000	0.000	0.000	**0.488**	0.000	0.000	0.000
A1	0.000	**0.384**	0.000	0.000	0.000	0.000	0.000
B39	0.000	0.000	0.000	**0.351**	0.000	0.267	0.000
B21	0.000	**0.449**	0.000	0.000	0.000	0.000	0.000
D73	0.000	0.000	0.000	0.000	**0.471**	0.000	0.000
E79	**0.361**	0.000	0.000	0.000	0.310	0.000	0.000
C55	0.000	0.000	**0.432**	0.000	0.000	0.000	0.000
Cronbach Alpha Coefficient	0.8449	0.7881	0.7492	0.5911	0.7336	0.7095	0.6602
Accounted % of Variance	16.2618%	2.6830%	1.9853%	1.8183%	1.6733%	1.6457%	1.2232%
	16	12	5	7	9	9	4

Analysis of: 63 items on five-factors for total item set of 93 items (Tables 4.20 to 4.21)

The Scree test identified 15 items with Kaiser's Eigenvalues higher than 1.00 and a Cronbach Alpha Coefficient for all the variables of 0.9494 and it was clear that the Scree plot still suggested the presence of a general factor as predicted from the correlation matrix. A large first Eigenvalue (15.7015) and a much smaller second Eigenvalue (3.11977) still suggest the presence of a dominant factor.

One factor had a Cronbach Alpha Coefficient lower than 0.70 and three factors had nine or less items with loadings higher than 0.30. The researcher decided to eliminate the items with loadings lower than 0.30 and to perform a three-factor analysis (See Tables 4.22 to 4.23).

Table 4.20 Eigenvalues and % variance for 63 items (N = 313)

Factor	Eigenvalue	% Variance	Variance in Data Space
1	15.7015	15.0759	0.2393
2	3.11977	2.4566	0.2783
3	2.45846	1.8275	0.3073
4	2.36962	1.7462	0.3350
5	2.18824	1.5835	0.3602
6	2.10532		
7	1.72297		
	Etc.		

Table 4.21 Sorted rotated factor loadings on 63 items on 5 factors (N = 313)

Item	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
G88	**0.636**	0.000	0.000	0.000	0.000
G89	**0.628**	0.000	0.000	0.000	0.000
B51	**0.546**	0.000	0.000	0.000	0.000
F84	**0.523**	0.000	0.000	0.000	0.000
F86	**0.523**	0.000	0.000	0.000	0.000
C61	**0.515**	0.000	0.000	0.000	0.000
F87	**0.507**	0.000	0.000	0.000	0.000
B31	**0.502**	0.000	0.000	0.000	0.000
A3	0.000	**0.542**	0.000	0.000	0.000
B33	0.000	**0.535**	0.000	0.000	0.000
B43	0.000	**0.534**	0.000	0.000	0.000
B11	0.000	**0.504**	0.000	0.000	0.260
C62	0.000	0.000	**0.592**	0.000	0.000
D72	0.000	0.000	**0.559**	0.000	0.000
D70	0.000	0.000	**0.505**	0.000	0.000
B50	0.000	0.000	0.000	**0.405**	0.000
B36	0.000	0.000	0.000	**0.577**	0.000
A2	0.312	0.000	0.000	0.000	**0.432**
C63	0.000	0.274	0.413	-0.412	**0.418**
C59	0.000	0.000	0.299	0.286	**0.417**
D73	0.000	0.000	0.000	0.000	**0.397**
B12	0.000	0.000	0.000	0.000	**0.357**
E79	**0.357**	0.000	0.000	0.000	0.310
F83	**0.489**	0.000	0.000	0.000	-0.310
C58	0.000	**0.416**	0.000	0.000	0.302
E77	0.000	0.267	0.000	0.000	**0.301**
E82	**0.387**	0.000	0.000	0.000	0.301
B41	0.000	0.000	0.000	**0.290**	0.289
B16	**0.463**	0.000	0.000	0.000	0.282

Item	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
B19	0.257	0.000	0.000	0.000	**0.270**
B15	0.000	0.000	0.000	**0.282**	0.266
D69	0.000	0.000	0.273	**0.290**	0.000
D71	0.000	0.000	0.000	**0.360**	0.000
D66	0.000	0.000	0.000	**0.487**	0.000
D74	0.000	0.000	**0.355**	0.000	0.000
B46	**0.482**	0.000	0.000	0.000	0.000
B38	0.000	0.000	0.000	**0.398**	0.000
A1	0.000	**0.455**	0.000	0.000	0.000
E80	0.334	0.000	0.000	**0.400**	0.000
B22	0.000	0.000	**0.412**	0.000	0.000
B21	0.000	**0.454**	0.000	0.000	0.000
B34	0.000	0.000	0.000	0.000	0.000
B10	0.000	**0.363**	0.000	0.000	0.000
E76	**0.411**	-0.303	0.296	0.000	0.000
B35	**0.482**	0.000	0.000	0.000	0.000
B14	0.000	0.000	**0.453**	0.000	0.000
C60	0.000	**0.470**	0.000	0.000	0.000
A7	0.291	**0.410**	-0.283	0.000	0.000
B47	**0.498**	0.000	0.000	0.000	0.000
C52	0.257	0.000	**0.327**	0.000	0.000
E81	0.000	0.000	**0.323**	0.000	0.000
B39	0.000	0.000	**0.460**	0.000	0.000
C55	0.000	**0.265**	0.000	0.000	0.000
B17	0.265	**0.451**	0.000	0.000	0.000
C53	0.000	**0.331**	0.253	0.000	0.000
B24	0.000	0.000	0.000	**0.476**	0.000
G93	**0.459**	0.279	-0.394	0.000	0.000
B20	0.000	**0.485**	0.000	0.000	0.000
B45	0.000	0.000	0.000	**0.271**	0.000
B40	0.000	0.000	0.000	**0.460**	0.000
B48	0.000	**0.448**	0.000	0.000	0.000
A8	0.332	0.000	0.000	**0.349**	0.000
G92	**0.495**	0.000	0.000	0.000	0.000
Cronbach Alpha Coefficient Accounted % of Variance	0.8757 15.0759%	0.8000 2.4566%	0.7793 1.8275%	0.7681 1.7462%	0.4727 1.5835%
	18	14	9	9	6

Analysis of: 63 items on three factors for total item set of 93 items (Tables 4.22 to 4.23)

The Scree test identified 15 items with Kaiser's Eigenvalues higher than 1.00 and a Cronbach Alpha Coefficient for all the variables of 0.9494, it was clear that the Scree plot still suggested the presence of a general factor as predicted from the correlation matrix. A large first Eigenvalue (15.7015) and a much smaller second Eigenvalue (3.11977) still suggest the presence of a dominant factor.

One factor had a Cronbach Alpha Coefficient lower than 0.70 and with only six items with loadings higher than 0.30. The second factor had a Cronbach Alpha Coefficient higher than 0.70 and fifteen items with loadings higher than 0.30. The researcher however decided to perform a one-factor analysis on the 63 items to conclude the analysis on the total item set of 93 items (See Tables 4.24 to 4.25).

Table 4.22 Eigenvalues and % variance for 63 items (N = 313)

Factor	Eigenvalue	% Variance	Variance in Data Space
1	15.7015	15.0217	0.2384
2	3.11977	2.4395	0.2772
3	2.45846	1.7850	0.2055
4	2.36962		
5	Etc.		

Table 4.23 Sorted rotated factor loadings on 63 items on 3 factors (N = 313)

Item	Factor 1	Factor 2	Factor 3
G88	**0.718**	0.000	0.000
G89	**0.663**	0.000	0.000
B47	**0.629**	0.000	0.000
G93	**0.601**	0.000	0.331
B51	**0.595**	0.000	0.000
A8	**0.593**	0.000	0.000
B46	**0.576**	0.000	0.000
B16	**0.570**	0.000	0.000
E82	**0.561**	0.000	0.000
G92	**0.547**	0.000	0.000
F87	**0.547**	0.000	0.000
E80	**0.533**	0.000	0.000
B40	**0.515**	0.000	0.000
B36	**0.514**	0.000	0.000
B33	0.000	**0.548**	0.000
B43	0.000	**0.547**	0.000
B20	0.000	**0.534**	0.000
A3	0.000	**0.529**	0.000

Item	Factor 1	Factor 2	Factor 3
B11	0.000	**0.522**	0.000
B48	0.000	**0.518**	0.000
C60	0.000	**0.517**	0.000
D72	0.000	0.000	**0.602**
C63	0.000	0.297	**0.582**
C52	0.000	0.000	**0.409**
B14	0.000	0.313	**0.387**
E76	**0.388**	-0.309	0.372
B22	0.000	0.000	**0.348**
C62	0.000	0.000	**0.331**
B24	**0.457**	0.000	-0.295
B39	**0.347**	0.000	0.276
D70	0.000	0.000	**0.274**
B35	**0.269**	0.000	**0.269**
E79	**0.405**	0.000	0.260
E81	0.000	0.000	**0.255**
C58	0.000	**0.471**	0.000
E77	0.000	**0.306**	0.000
C61	0.000	**0.424**	0.000
A7	**0.384**	0.345	0.000
D74	0.000	0.000	0.000
B12	**0.257**	0.000	0.000
F86	**0.410**	0.000	0.000
C59	**0.355**	0.000	0.000
B31	**0.391**	0.000	0.000
B34	**0.430**	0.000	0.000
B38	**0.434**	0.000	0.000
F84	**0.382**	0.000	0.000
C53	0.000	**0.396**	0.000
D73	**0.365**	0.000	0.000
C55	0.000	**0.324**	0.000
A1	0.000	**0.474**	0.000
A2	**0.465**	0.000	0.000
F83	**0.425**	0.000	0.000
D71	**0.296**	0.287	0.000
B15	**0.437**	0.000	0.000
D69	0.000	**0.270**	0.000
B17	**0.406**	0.000	0.000
B41	**0.324**	0.000	0.000
B50	**0.485**	0.000	0.000
B21	0.000	**0.467**	0.000
D66	**0.487**	0.000	0.000

Item	Factor 1	Factor 2	Factor 3
B19	**0.458**	0.000	0.000
B45	0.000	0.000	0.000
B10	0.000	**0.401**	0.000
Cronbach Alpha Coefficient	0.9208	0.8583	0.6949
Accounted % of Variance	15.0217%	2.4395%	1.7850%
	33	15	6

Analysis of: 61 items on one factor for total item set of 93 items (Tables 4.24 to 4.25)

The remaining items were subject to two further one-factor analyses until all remaining items measured a loading greater than 0.30. The first analysis' Scree test identified 15 items with Kaiser's Eigenvalues higher than 1.00 and a Cronbach Alpha Coefficient for all the variables of 0.9497. The large first Eigenvalue (15.7015) and a much smaller second Eigenvalue (3.11977) explained the preference for one factor.

Two items further had loadings less than 0.30 and were eliminated. The second analysis' Scree test on the remaining 61 items identified 15 items with Kaiser's Eigenvalues higher than 1.00 and a Cronbach Alpha Coefficient for all the variables of 0.9497. The large first Eigenvalue (15.5596) and a much smaller second Eigenvalue (2.89086) explained the preference for one factor. All factors' items had loadings higher than 0.30. This analysis concluded the analysis on the total item set of 93 items.

Table 4.24 Eigenvalues and % variance for 61 items (N = 313)

Factor	Eigenvalue	% Variance	Variance in Data Space
1	15.5596	14.8207	0.2430
2	2.89086		
3	2.43974		
	Etc.		

Table 4.25 Sorted rotated factor loadings on 61 items on 1 factor (N = 313)

Item	Factor 1
B51	**0.651**
G89	**0.645**
E82	**0.637**
G92	**0.632**
G88	**0.627**
C61	**0.627**
C60	**0.594**
F83	**0.584**
E79	**0.583**
E80	**0.582**
G93	**0.571**

Item	Factor 1
B46	**0.569**
C58	**0.562**
F87	**0.560**
B43	**0.554**
C59	**0.541**
F84	**0.535**
F86	**0.533**
B36	**0.531**
B39	**0.527**
C53	**0.525**
A3	**0.522**
E77	**0.515**
D66	**0.508**
B50	**0.507**
B48	**0.504**
A2	**0.502**
D72	**0.499**
B35	**0.487**
D73	**0.485**
B14	**0.485**
A7	**0.476**
B38	**0.469**
B31	**0.467**
B19	**0.466**
B33	**0.463**
C63	**0.457**
C62	**0.456**
E81	**0.453**
B47	**0.449**
B16	**0.447**
B40	**0.444**
A8	**0.443**
D71	**0.443**
B15	**0.442**
C52	**0.436**
B17	**0.435**
B22	**0.418**
D74	**0.403**
B11	**0.403**
B10	**0.398**
B34	**0.396**
B41	**0.385**
B45	**0.381**

Item	Factor 1
B24	**0.363**
D69	**0.347**
D70	**0.344**
B12	**0.344**
E76	**0.337**
C55	**0.335**
B20	**0.334**
Cronbach Alpha Coefficient	0.9497
Accounted % of Variance	14.8207%

Conclusion on analysis on total item set of 93 items

Finally the researcher analyzed the results derived from the repeated analysis on the total item set of 93 items according to the theoretical meaningfulness of the factors extracted. Conceptually the results did not make sense, as they were less interpretable than the results obtained from the analysis of the seven separate criteria determined by the researcher. According to the analysis on the total item set of 93 items, 32 items in total had a factor loading lower than 0.30 and had to be eliminated from the final assessment model, whereas the analysis on the clustered criteria resulted in only four items with factor loadings lower than 0.30.

The elimination of a total of 32 items, which in the researcher's opinion will render the instrument invalid, as well as the absence of new clearly defined criteria proved that the analysis of the factors per criteria as determined by the researcher resulted in the more meaningful and interpretable model (See Tables 4.26 – 4.53).

4.2.2.2.2. Factor Analysis on: 7 predetermined criteria of 93 items

According to the relevant key areas identified within the research the researcher clustered the 93 items in seven criteria, i.e.:

- Strategy formulation and governance of the Business Process Management function;
- Structure, roles, responsibilities, policies, procedures and people management for the Business Process Management function;
- The way the Business Process Management function creates a sustained way of managing and maintaining the "process architecture";
- The way the Business Process Management function creates a sustained way of managing and maintaining the "systems and information architecture";
- The way the organization remains competitive through optimizing and improving current business processes;
- The way the organization ensures continual improvement of business processes; and
- The way the organization evaluates and assesses business processes against appropriate standards.

Each of the seven criteria was subjected to EFA with Direct Quartimin rotation within the BMDP Statistical Software (1993). The results per criteria as reported in this section were derived (See tables 4.26 to 4.53).

In the analysis of the different criteria a Scree test was used to determine within each criterion the number of items with Kaiser's Eigenvalues higher than 1.0. The factors were chosen based on the results of the Scree test, the percentage variance as well as the Cronbach Alpha Coefficient. The factors were subject to further Factor Analysis. The rotated analysis results were utilized to analyze the factor loadings. Variables with factor loadings ≤ 0.30 were eliminated within the premise (loadings 0.30 – 0.60 = moderate and loadings 0.60 – 1.00 = high).

4.2.2.2.2.1 Factor Analysis on Criteria: Strategy Formulation

The Scree test on the eight factors within the "Strategy Formulation" criteria identified two items with a Kaisers' Eigenvalue of > 1.00 (See table 4.26).

Table 4.26 Eigenvalues and % variance for Criteria: Strategy Formulation (N = 313)

Factor	Eigenvalue	% Variance	Variance in Data Space
1	2.77152	34.64	0.2012
2	1.07476	13.43	0.3595

From the variance percentage of the two factors it is clear that a one-factor scale is evident (See Table 4.27). Although all factor loadings on factor 1 loaded significantly, only 1 item in the second factor loading loaded higher than 0.30 with a Cronbach Alpha Coefficient of 0.6663.

The preference for a one-factor was clear and further analysis on a one-factor was done. One variable (Item A1) with a factor loading lower than 0.30 failed to load significantly, and was eliminated.

The remaining 7 items were subjected to a further one-factor analysis and all seven remaining items measured a loading greater than 0.30. The final analysis' Scree test identified one item with a Kaiser Eigenvalue higher than 1.00 and a Cronbach Alpha Coefficient for all the variables of 0.7315 (Table 4:28). This analysis concluded the analysis on the Criteria "Strategy Formulation".

Table 4.27 Sorted rotated factor loadings on 8 items on two factors for Criteria: Strategy Formulation (N = 313)

Item	Factor 1	Factor 2
A3	**0.584**	0.000
A6	**0.561**	0.000
A4	**0.507**	0.000
A2	0.000	**0.943**
A5	**0.348**	0.276
A1	**0.440**	0.000
A7	**0.479**	0.000
A8	**0.395**	0.000
Cronbach Alpha Coefficient	0.7237	0.6663
Accounted % of Variance	34.64%	13.43%

Table 4.28 Sorted rotated factor loadings on 7 items on one factor for Criteria: Strategy Formulation (N = 313)

Item	Factor 1
A2 The BPM strategic planning process must balance the needs and expectations of all stakeholders.	0.603
A3 BPM strategy and supporting policies must regularly be reviewed, updated and improved.	0.558
A7 BPM governance rules must be defined, and integrated into the enterprise governance process	0.556
A6 Compliance to BPM standards must be measured via formal assessment practices.	0.552
A5 The BPM strategy must be translated into strategic business plans in every business unit.	0.520
A4 There must be an organization-wide evaluation of people's awareness of the BPM strategy	0.495
A8 A formal reporting process must be in place to rectify non-compliance to BPM policy.	0.450
Cronbach Alpha Coefficient **Accounted % of Variance**	**0.7315** **28.24%**

4.2.2.2.2.2 Factor Analysis on Criteria: Structure, roles, responsibilities, policies, procedures and people management

The Scree test on the forty three items within the criteria: "Structure, roles, responsibilities, policies, procedures and people management" identified twelve items with a Kaiser Eigenvalue of > 1.00 (See table 4.29)

Table 4.29 Eigenvalues and % variance for Criteria: Structure, roles, responsibilities, policies, procedures and people management (N = 313)

Factor	Eigenvalue	% Variance	Variance in Data Space
1	10.2167	0.23760	0.0806
2	2.23064	0.05188	0.2503
3	1.97413	0.04591	0.2885
4	1.72443	0.04010	0.3189
5	1.66603	0.03874	0.3463
6	1.53707	0.03575	0.3759
7	1.43033	0.03326	0.3987
8	1.36611	0.03177	0.4194
9	1.30322	0.03031	0.4403
10	1.16219	0.02703	0.4567
11	1.12126	0.02608	0.4715
12	1.05639	0.02457	0.4854

From the variance percentage of the twelve items it is clear that a one-factor or possibly a three-factor scale is evident. A further Factor Analysis on three-factors and one-factor was done to develop the scale instrument.

The three-factor analysis (see Table 4.30) on criteria: "Structure, roles, responsibilities, policies, procedures and people management" shows that the one-factor (See Table 4.31) is more reliable with a Cronbach Alpha Coefficient of 0.9216 and total variance in Data Space of 21.99%. No variable had a factor loading lower than 0.30 resulting in all items remaining.

Table 4.30 Sorted rotated factor loadings on 43 items on three-factors for Criteria: Structure, roles, responsibilities, policies, procedures and people management (N = 313)

Item	Factor 1	Factor 2	Factor 3
B49	**0.722**	0.000	0.000
B36	**0.587**	0.000	0.000
B50	**0.586**	0.000	0.000
B38	**0.511**	0.000	0.000
B24	**0.501**	0.000	0.000
B23	0.000	**0.713**	0.000
B47	0.321	**0.508**	-0.321
B33	0.000	0.000	**0.720**
B25	0.000	0.000	**0.521**
B11	0.278	0.000	**0.516**
B48	0.257	0.000	**0.485**
B43	0.000	0.000	**0.484**
B20	0.000	0.000	**0.393**
B21	0.000	0.000	**0.371**
B14	0.000	**0.479**	0.358
B37	**0.374**	0.000	0.354
B22	0.000	**0.368**	0.305
B35	0.000	0.000	**0.292**
B17	0.000	0.000	**0.288**
B30	**0.408**	0.000	0.000
B10	0.000	**0.421**	0.000
B27	**0.354**	0.000	0.000
B42	**0.274**	0.000	0.000
B28	0.000	**0.346**	0.000
B39	**0.262**	0.000	0.000
B41	**0.353**	0.000	0.000
B51	**0.469**	0.000	0.000
B18	**0.350**	0.000	0.000
B34	0.000	**0.439**	0.000
B31	0.000	**0.446**	0.000
B9	**0.343**	0.259	0.000
B45	0.000	0.000	0.000
B16	**0.396**	0.000	0.000
B44	0.000	0.000	0.000
B40	**0.368**	0.261	0.000

Item	Factor 1	Factor 2	Factor 3
B15	**0.328**	0.000	0.000
B26	0.000	**0.350**	0.000
B12	0.000	0.000	0.000
B46	0.262	**0.387**	0.000
B19	0.000	**0.371**	0.000
B13	0.000	**0.351**	0.000
B32	0.266	**0.333**	0.000
B29	**0.380**	0.000	0.000
Cronbach Alpha Coefficient	0.8475	0.7333	0.7239
Accounted % of Variance	22.14%	25.79%	28.85%

Table 4.31 Sorted rotated factor loadings on 43 items on one factor for Criteria: Structure, roles, responsibilities, policies, procedures and people management (N = 313)

Item		Factor 1
B27	Cross-functional project teams with decision-making capability must be formed and utilized.	**0.601**
B9	The organization should have formal approved and maintained enterprise architecture in place.	**0.559**
B36	A Human Resources Management plan for the BPM Function must be in place supported by adequate funding.	**0.556**
B28	Cross-functional project teams should be properly trained in process improvement techniques to compliment their subject-matter expertise.	**0.551**
B30	All business-process stakeholders (internal and external) must actively be involved in business and process improvement initiatives.	**0.543**
B46	Performance and capabilities must be assessed and measured against agreed and contracted critical performance areas.	**0.539**
B49	There must be an inventory kept of all communication passed into the BPM system.	**0.534**
B43	Training and education must be critical components of the employee's career path.	**0.527**
B50	There must be a control process in place to ensure that all participants received and acknowledged communication passed into the BPM system.	**0.523**
B38	BPM enterprise-wide succession plans must be in place to ensure continuous availability of the required quality and skilled staff.	**0.511**
B37	There must be consistency between the BPM Strategic plan and the BPM Human Resources Management plan.	**0.510**
B48	BPM communication must be channeled through and reviewed at a central point to ensure it includes all the information required.	**0.509**
B42	The education and training programs must be supported by dedicated trainers.	**0.507**
B39	A comprehensive education and training strategy supported by detail training programs, focused on individual and corporate needs, must be in place.	**0.503**
B32	The organization's stakeholder's expectations should be included into improvement initiatives.	**0.499**
B19	Staff and Line management must act as champions of change initiated by the BPM functionality.	**0.495**
B18	Management must have control over the critical success factors of the BPM function.	**0.485**
B31	Processes should be fully understood by all the stakeholders involved.	**0.482**
B40	Appropriate ongoing BPM training and career development must be performed to fulfill the needs of the BPM human resources management plan.	**0.474**

Item		Factor 1
B15	Roles and responsibilities must be designed to empower BPM staff.	**0.471**
B35	Awareness, understanding and compliance to policies, procedures and rules must be measured.	**0.470**
B41	The education and training programs must be supported by budgets, resources, and facilities.	**0.464**
B33	Well-defined policies, procedures, rules and goal statements must be developed for every process.	**0.462**
B14	Owners of core processes must be formally assigned the responsibility as part of his/her critical performance areas.	**0.446**
B13	Essential BPM functions must be explicitly identified with clearly specified roles and responsibilities.	**0.445**
B17	Management must display a hands-on responsibility and ownership of the critical success factors of the BPM function.	**0.441**
B47	The controls needed for measurement of BPM staff must be in place at the point of accountability.	**0.437**
B11	The BPM organizational structure must be aligned with the organizations business model.	**0.430**
B23	Process owners and custodians should be regarded as role models with in-depth knowledge and should be respected within the organization.	**0.423**
B10	The organizational structure must enable the management of business processes horizontally across business units.	**0.422**
B16	Management must endorse ownership of the critical success factors of the BPM function.	**0.418**
B34	There must be practical guidance on how to implement BPM policies, procedures and rules	**0.418**
B24	Analysts should be competent to manage the total process improvement cycle and functions.	**0.412**
B26	Analyst's recommendations should be respected throughout the organization.	**0.399**
B25	Analysts should be full-time dedicated to process management and not part-time committed.	**0.393**
B45	Business process staff's performance must be measured against the business process performance as apposed to functional activities.	**0.375**
B20	Steering committees with decision-making capability must be active within all the major BPM initiatives.	**0.374**
B22	Process ownership and custodianship must be full-time dedicated positions with the major critical performance area being the management of end-to-end processes.	**0.367**
B12	Financial management regarding BPM should be well established and controlled on strategic and operational level.	**0.353**
B21	Senior management must display their commitment to BPM initiatives through leadership roles within the steering committees.	**0.348**
B44	All BPM staff must initially and on a continuous basis be trained on all technical aspects of their work e.g. analysis, mapping, improvement techniques etc.	**0.326**
B29	The organization should have the ability to capture and utilize the intelligence that external consultants bring.	**0.309**
Cronbach Alpha Coefficient Accounted % of Variance		0.9216 21.99%

4.2.2.2.2.3 Factor Analysis on Criterion: Process Architecture

The Scree test on the twelve items within the criterion: "Process Architecture" identified three items with a Kaiser Eigenvalue of > 1.00 (See table 4.32).

Table 4.32 Eigenvalues and % variance for Criterion: Process Architecture (N = 313)

Factor	Eigenvalue	% Variance	Variance in Data Space
1	4.07914	0.33993	0.2776
2	1.10603	0.09217	0.3154
3	1.01514	0.08460	0.3353

From the variance percentage of the three factors it is clear that a one-factor or two-factor scale is evident. A further Factor Analysis on two-factors and one-factor was done to develop the scale instrument.

The two-factor analysis (see Table 4.33) on criterion: "Process Architecture" shows that the one-factor is more reliable with a Cronbach Alpha Coefficient of 0.8149 and 28.72% variance in data space. Although the second factor had a Cronbach Alpha Coefficient of 0.7688 only one item loaded higher than 0.30. One item (Item C56) had a factor loading lower than the acceptable level and was eliminated.

The remaining items were subject to a further one-factor analysis and all eleven remaining items measured a loading greater than 0.30. The final analysis' Scree test identified 2 items with a Kaiser Eigenvalue higher than 1.00 and a Cronbach Alpha Coefficient for all the variables of 0.8224 (See Table 4.34). The large first Eigenvalue (4.01799) and a much smaller second Eigenvalue (1.02604) explain the preference for one factor. This analysis concluded the analysis on the Criteria "Process Architecture".

Table 4.33 Sorted rotated factor loadings on 12 items on two factors for Criteria: Process Architecture (N = 313)

Item	Factor 1	Factor 2
C53	**0.748**	0.000
C60	**0.740**	0.000
C61	**0.627**	0.000
C54	**0.607**	0.000
C63	0.000	**0.801**
C62	**0.308**	0.286
C58	**0.474**	0.258
C57	0.000	0.000
C59	**0.421**	0.000
C52	**0.358**	0.000
C56	0.000	0.000
C55	**0.466**	0.000
Cronbach Alpha Coefficient	0.8149	0.7688
Accounted % of Variance	28.72%	32.95%

Table 4.34 Sorted rotated factor loadings on 11 items on one factor for Criteria: Process Architecture (N = 313)

Item	Factor 1
C60 Measurable quality standards regarding process maps and documentation must be clearly defined.	**0.677**
C53 A process taxonomy or classification must be agreed and designed for the organization and all processes must be classified accordingly.	**0.662**
C58 Standards for every attribute on the process map must be determined, documented and implemented.	**0.647**
C61 Roles and responsibilities to manage the quality assurance processes and quality control procedures must be defined.	**0.599**
C54 All process maps must be linked to the taxonomy to give a holistic view and sufficient details on all levels of the organization's business processes in all areas.	**0.548**
C59 Process maps must clearly indicate what functions the system must perform to enable the utilization of process maps when systems are built.	**0.542**
C63 A well-controlled change control and version control process must be in place.	**0.508**
C62 Quality education and training programs must be compulsory for all persons mapping processes – inclusive of external consultants utilized by the organization.	**0.501**
C52 The concepts "end-to-end process" / "process architecture" must be accepted by all stakeholders.	**0.470**
C55 Interfaces between the high-level processes and sub-processes must be clearly indicated in the taxonomy and on the maps.	**0.459**
C57 A standard framework for process maps, process supporting documentation and procedures must be defined and monitored.	**0.373**
Cronbach Alpha Coefficient Accounted % of Variance	0.8224 30.44%

4.2.2.2.2.4 Factor Analysis on Criteria: Systems and information architecture

The Scree test on the eleven items within the criteria: "Systems and information architecture" identified three items with a Kaiser Eigenvalue of > 1.0 (See table 4.35).

Table 4.35 Eigenvalues and % variance for Criteria: Systems and information architecture

Factor	Eigenvalue	% Variance	Variance in Data Space
1	3.37547	0.30686	0.1382
2	1.29669	0.11788	0.3198
3	1.12410	0.10219	0.4048

From the variance percentage of the three factors it is clear that a one-factor or two-factor scale is evident. A further Factor Analysis on two-factors and one-factor was done to develop the scale instrument.

The two-factor analysis (see Table 4.36) on "Systems and information architecture" shows that the one-factor is more reliable with a Cronbach Alpha Coefficient of 0.7127 and contributes 30.68%. The second factor had a Cronbach Alpha Coefficient of 0.5825 and contributes only 11.78%. One item

(Item D69) had a factor loading lower than the acceptable level and was eliminated. The remaining items were subject to a further one-factor analysis and all ten remaining items measured a loading greater than 0.30. The final analysis' Scree test identified 3 items with a Kaiser Eigenvalue higher than 1.00 and a Cronbach Alpha Coefficient for all the variables of 0.7650. This analysis concluded the analysis on the Criteria "Process Architecture" (See Table 4.37).

Table 4.36 Sorted rotated factor loadings on 11 items on two factors for Criteria: Systems and information architecture (N = 313)

Item	Factor 1	Factor 2
D68	**0.674**	0.000
D65	**0.597**	0.000
D71	**0.553**	0.000
D74	0.000	**0.645**
D72	0.000	**0.616**
D70	0.000	**0.482**
D69	0.000	**0.288**
D67	**0.343**	0.260
D73	**0.437**	0.000
D64	**0.308**	0.000
D66	**0.445**	0.000
Cronbach Alpha Coefficient	0.7127	0.5825
Accounted % of Variance	24.62%	30.38%

Table 4.37 Sorted rotated factor loadings on 10 items on one factor for Criteria: Systems and information architecture (N = 313)

Item	Factor 1
D65 The systems infrastructure must be designed to promote and share standards on business process documentation among stakeholders.	**0.714**
D73 A systematic solution must be in place to link all business process- related systems.	**0.565**
D66 The systems infrastructure must be designed to promote and share standards on technical documentation among stakeholders.	**0.530**
D72 A centralized process repository must be used to ensure one approved process view across all business units.	**0.530**
D68 There must be cooperation between BPM and Technology to ensure maximum benefit for the organization through the process management systems.	**0.523**
D67 The systems infrastructure must be designed to promote and share standards on training material among stakeholders.	**0.520**
D64 The organization must have a formal systems architecture that governs the entire enterprise information value chain.	**0.411**
D74 All signed-off business processes must be published on an organization-wide public domain to allow read-only access to all stakeholders.	**0.405**
D71 The automation of business process must form part of the organization's vision and current and future systems and process architecture.	**0.395**
D70 The BPM team must be fully trained to use the mapping tool.	**0.370**
Cronbach Alpha Coefficient Accounted % of Variance	0.7650 25.61%

4.2.2.2.2.5 Factor Analysis on Criteria: Optimizing and improving current business processes

The Scree test on the eight items within the criteria: "Optimizing and improving current business processes" identified two items with a Kaiser Eigenvalue of > 1.00 (See table 4.38).

Table 4.38 Eigenvalues and % variance for Criteria: Optimizing and improving current business processes (N = 313)

Factor	Eigenvalue	% Variance	Variance in Data Space
1	2.81859	0.35232	0.1555
2	1.06329	0.13291	0.3864

From the variance percentage of the two factors it is clear that a one-factor scale is evident. A further Factor Analysis on one-factor was done to develop the scale instrument.

The two-factor analysis (see Table 4.39) on "Optimizing and improving current business processes" shows that the one-factor is more reliable with a Cronbach Alpha Coefficient of 0.7292 and contributes 35.23%. The second factor had a Cronbach Alpha Coefficient of 0.7290 and contributes 13.29% but had only one item with a factor loading ≥ 0.30. This explains the preference for one-factor (See Table 4.40) with a final Cronbach Alpha Coefficient of 0.7292 and a total variance in Data Space of 26.56%.

Table 4.39 Sorted rotated factor loadings on 8 items on two factors for Criteria: Optimizing and improving current business processes (N = 313)

Item	Factor 1	Factor 2
E82	**0.680**	0.000
E75	**0.617**	0.000
E77	**0.612**	0.000
E79	**0.538**	0.000
E78	0.000	**0.997**
E76	**0.296**	0.000
E80	**0.444**	0.000
Cronbach Alpha Coefficient	0.7292	0.7290
Accounted % of Variance	15.55%	38.64%

Table 4.40 Sorted rotated factor loadings on 8 items on one factor for Criteria: Optimizing and improving current business processes (N = 313)

Item	Factor 1
E82	**0.663**
E75	**0.620**
E79	**0.565**
E77	**0.550**
E81	**0.479**
E80	**0.478**
E76	**0.357**
E78	**0.305**
Cronbach Alpha Coefficient	0.7292
Accounted % of Variance	26.56%

4.2.2.2.2.6 Factor Analysis on Criteria: Continuous improvement of business processes

The Scree test on the five-factors within the criteria: "Continuous improvement of business processes" identified only one item with a Kaiser Eigenvalue of > 1.00 (See table 4.41).

Table 4.41 Eigenvalues and % variance for Criteria: Continuous improvement of business processes (N = 313)

Factor	Eigenvalue	% Variance	Total Variance in Data Space
1	2.21064	0.44213	0.3171

With a Cronbach Alpha Coefficient of only 0.6751 and a total variance in Data Space of 15.86% (See Table 4.42) the criteria did not meet the acceptable Cronbach Alpha Coefficient criteria of ≥ 0.70.

Table 4.42 Sorted rotated factor loadings on 5 items on one factor for Criteria: Continuous improvement of business processes (N = 313)

Item	Factor 1
F83	**0.770**
F87	**0.566**
F86	**0.529**
F84	**0.516**
F85	**0.357**
Cronbach Alpha Coefficient	0.6751
Accounted % of Variance	15.86%

Taking into account the similarity of the criteria "Optimizing and improving current business processes" and "Continuous improvement of business processes" the researcher combined the two criteria and further analyses were performed to determine if the two criteria should be presented as one criterion i.e. "Optimizing of business processes" (See Table 4.42a – 4.42c).

Table 4.42a Eigenvalues and % variance for combined Criteria: Optimizing of business processes (N = 313)

Factor	Eigenvalue	% Variance	Total Variance in Data Space
1	1.21134	0.09318	0.1785
2	1.05097	0.08084	0.3382
3	1.01455	0.07804	0.3822

The Scree test on the thirteen items within the criteria: "Optimizing of business processes" identified three items with a Kaiser Eigenvalue of > 1.00 (See table 4.42a).

From the variance percentage of the three factors it is clear that a one-factor or two-factor scale is evident. A further Factor Analysis on two-factors and one-factor was done to develop the scale instrument.

The two-factor analysis (see Table 4.42b) on the criteria "Optimizing of business processes" shows that the one-factor is more reliable with a Cronbach Alpha Coefficient of 0.7311 and contributes 9.3%. The second factor had a Cronbach Alpha Coefficient of 0.5999 and contributes 8%. This explains the preference for one-factor with a final Cronbach Alpha Coefficient of 0.8248 and a total variance in data space of 27.55% (See Table 4.42c). No item had a factor loading lower than the acceptable level and all items were retained.

Table 4.42b Sorted rotated factor loadings on 13 items on two factors for Criteria: Optimizing of business processes (N = 313)

Item	Factor 1	Factor 2
E82	**0.771**	0.000
F87	**0.701**	0.000
F86	0.000	**0.825**
E80	0.000	**0.491**
F83	0.302	**0.398**
E78	0.000	**0.369**
F84	0.297	**0.338**
F85	0.000	**0.330**
E79	**0.326**	0.315
E76	0.000	**0.311**
E75	**0.490**	0.000
E81	**0.443**	0.000
E77	**0.496**	0.000
Cronbach Alpha Coefficient	0.7311	0.5999
Accounted % of Variance	27.95%	32.35%

Table 4.42c Sorted rotated factor loadings on 13 items on one factor for Criteria: Optimizing of business processes (N = 313)

Item	Factor 1
E82 The management of risk (Organizational, process, project) must form an integral part of all BPM improvement initiatives.	**0.637**
F83 The organization must have an overall process review program that manages the life cycle of improvement and optimization.	**0.627**
F87 All new process implementations must have a post-implementation assessment phase that will provide sufficient feedback on measurement aspects to management.	**0.601**
E75 The organization must have a process optimization vision and strategy in place as part of the BPM strategic plan.	**0.590**
E79 Management attention must be focused on execution and sustainability of improvement programs.	**0.578**
F84 The individual business units and process owners must have a process review plan which focuses on causing significant continuous improvements to processes.	**0.568**
E80 The organization must adapt tested improvement models / approaches / methodologies, supported by recognized process analysis and improvement techniques to ensure scientific process improvement solutions.	**0.541**
F86 There must be an integrated work plan that enforces the review of proposed processes by stakeholders during the improvement phase.	**0.512**
E81 Process improvement initiatives must be performed according to project management principles to ensure a focus of resources and abilities towards the desired outcome.	**0.500**
E77 Business process improvement must focus on end-to-end processes and overall process performance.	**0.479**
F85 The workforce must have the big picture regarding review of organization-wide core processes.	**0.406**
E76 The improvement of processes must be a continuous and joint undertaking among BPM staff, process owners, business units, and other stakeholders.	**0.343**
E78 All stakeholders must continuously focus on identification of process improvement opportunities.	**0.313**
Cronbach Alpha Coefficient Accounted % of Variance	0.8248 27.55%

4.2.2.2.2.7 Factor Analysis on Criteria: Assess business processes against appropriate standards

The Scree test on the six items within the criteria "Assess business processes against appropriate standards" identified only one item with a Kaiser Eigenvalue of > 1.00 (See table 4.43).

Table 4.43 Eigenvalues and % variance for Criteria: Assess Business Processes against appropriate Standards (N = 313)

Factor	Eigenvalue	% Variance	Total Variance
1	2.86347	23.08	0.3847

A one-factor with a final Cronbach Alpha Coefficient of 0.7722 and a total variance 23.08% was accepted.

Table 4.44 Sorted rotated factor loadings on 6 items on one factor for Criteria: Assess business processes against appropriate standards (N = 313)

Item	Factor 1
G88 Performance standards and compliance principles must be determined and included in all stages of the business process.	**0.764**
G92 Measurement techniques must ensure alignment with organization-wide goals, and must be integrated with the organization's overall measurement tools such as the Balanced Business Scorecard.	**0.724**
G89 The performance standards and responsibilities of stakeholders with regard to critical business processes must be well communicated and clearly understood by stakeholders.	**0.697**
G93 Through as-is processes it must be identified where and how measurement should be performed, i.e. service level agreements, etc.	**0.615**
G91 Measurements of process performance must be done on the end-to-end total quality of the process and must include financial, operational, customer, supplier and organizational criteria.	**0.414**
G90 Measurements of process performance must involve all stakeholders.	**0.405**
Cronbach Alpha Coefficient Accounted % of Variance	0.7722 23.08%

4.2.2.2.3 Summary on EFA

Three items were identified with a loading ≤0.32 (Items A1, C56 and D69) and were eliminated from the final model. The final result of the Factor Analysis was 90 items divided into six criteria that represent the BPMCAM. Table 4:45 summarizes the items per category that constitutes the BPMCAM, and Table 4:46 represents the details of the final item allocation to the six criteria.

Table 4.45 Final factor scale for the BPMCAM

Factor 1 Strategy	Factor 2 People and Structure	Factor 3 Process Architecture	Factor 4 Systems and Information Architecture	Factor 5 Process Optimization	Factor 6 Standards and Measurement
7 Items	42 Items	11 Items	10 Items	13 Items	6 Items

Table 4.46 Final items per six factor scale after item and EFA on the BPMCAM

Strategy	People and Structure	Process Architecture	Systems and Information Architecture	Process Optimization	Standards and Measurement
A3	B27; B9	C60	D65	E82	G88
A2	B36; B28	C53	D73	F83	G92
A7	B30; B46	C58	D72	F87	G89
A6	B49; B43	C61	D66	E75	G93
A5	B50; B38	C59	D67	E79	G91
A4	B37; B48	C54	D68	F84	G90
A8	B42; B39	C63	D64	E80	
	B32; B19	C62	D74	F86	
	B18; B31	C52	D71	E81	
	B40; B15	C55	D70	E77	
	B35; B41	C57		F85	
	B33; B14			E76	
	B13; B17			E78	
	B47; B11				
	B23; B10				
	B16; B34				
	B24; B26				
	B25; B45				
	B20; B22				
	B12; B21				
	B44; B29				
	B51;				
TOTAL NUMBER OF ITEMS = 90					

4.2.2.2.4 Final Item Analysis

After the EFA a final item analysis was done on the 90 remaining items out of the initial 93 items/ variables per factor root for each of the six criteria. The results of the final item analysis are shown in tables 4.47 – 4.53. All the items had a total item correlation of ≥ 0.32, which indicates that the items in the final model have a high validity.

Table 4:47 Final Item Analysis on the "Strategy" Factor root

Scale Item	Item Mean	Item Var.	Item Scale Correlation	N per item
1-1	4.514	0.333	.68	313
1-2	4.681	0.217	.61	313
1-3	4.578	0.314	.61	313
1-4	4.585	0.313	.62	313
1-5	4.626	0.272	.62	313
1-6	4.629	0.272	.63	313
1-7	4.530	0.262	.56	313

Table 4:48 Final Item Analysis on the "People and Structure" Factor root

Scale Item	Item Mean	Item Var.	Item Scale Correlation	N per item
2-1	4.511	0.314	.56	313
2-2	4.473	0.288	.46	313
2-3	4.610	0.257	.45	313
2-4	4.390	0.302	.37	313
2-5	4.716	0.210	.45	313
2-6	4.770	0.190	.47	313
2-7	4.594	0.305	.49	313
2-8	4.546	0.254	.42	313
2-9	4.594	0.279	.46	313
2-10	4.550	0.286	.49	313
2-11	4.633	0.239	.52	313
2-12	4.476	0.364	.40	313
2-13	4.626	0.292	.39	313
2-14	4.719	0.317	.39	313
2-15	4.594	0.279	.44	313
2-16	4.489	0.275	.43	313
2-17	4.623	0.318	.42	313
2-18	4.403	0.285	.43	313
2-19	4.412	0.306	.62	313
2-20	4.534	0.294	.57	313
2-21	4.182	0.417	.34	313
2-22	4.393	0.264	.55	313
2-23	4.505	0.263	.49	313
2-24	4.323	0.276	.52	313
2-25	4.620	0.306	.49	313
2-26	4.489	0.256	.45	313
2-27	4.537	0.255	.48	313
2-28	4.422	0.295	.57	313
2-29	4.265	0.412	.53	313
2-30	4.508	0.301	.53	313
2-31	4.546	0.273	.52	313
2-32	4.479	0.288	.50	313
2-33	4.428	0.270	.48	313
2-34	4.326	0.437	.54	313
2-35	4.508	0.282	.55	313
2-36	4.617	0.294	.35	313
2-37	4.281	0.579	.43	313
2-38	4.594	0.260	.54	313
2-39	4.518	0.320	.46	313
2-40	4.355	0.286	.53	313
2-41	4.310	0.310	.54	313
2-42	4.278	0.348	.53	313

Table 4:49 Final Item Analysis on the "Process Architecture" Factor root

Scale Item	Item Mean	Item Var.	Item Scale Correlation	N per item
3-1	4.466	0.281	.56	313
3-2	4.578	0.263	.68	313
3-3	4.655	0.258	.59	313
3-4	4.438	0.297	.53	313
3-5	4.744	0.190	.45	313
3-6	4.505	0.327	.68	313
3-7	4.482	0.384	.62	313
3-8	4.591	0.248	.68	313
3-9	4.482	0.262	.63	313
3-10	4.588	0.428	.60	313
3-11	4.783	0.170	.57	313

Table 4:50 Final Item Analysis on the "Systems and Information Architecture" Factor root

Scale Item	Item Mean	Item Var.	Item Scale Correlation	N per item
4-1	4.578	0.263	.51	313
4-2	4.550	0.260	.70	313
4-3	4.473	0.307	.62	313
4-4	4.508	0.288	.59	313
4-5	4.607	0.239	.56	313
4-6	4.617	0.275	.49	313
4-7	4.489	0.307	.48	313
4-8	4.709	0.213	.58	313
4-9	4.390	0.327	.62	313
4-10	4.626	0.317	.51	313

Table 4:51 Final Item Analysis on the "Process Optimization" Factor root

Scale Item	Item Mean	Item Var.	Item Scale Correlation	N per item
5-1	4.613	0.250	.61	313
5-2	4.597	0.260	.44	313
5-3	4.671	0.246	.53	313
5-4	4.489	0.320	.43	313
5-5	4.591	0.286	.64	313
5-6	4.524	0.313	.59	313
5-7	4.518	0.326	.56	313
5-8	4.556	0.298	.65	313
5-9	4.518	0.269	.65	313
5-10	4.581	0.263	.60	313
5-11	4.428	0.322	.50	313
5-12	4.569	0.277	.58	313
5-13	4.629	0.233	.60	313

Table 4:52 Final Item Analysis on the "Standards and Measurement" Factor root

Scale Item	Item Mean	Item Var.	Item Scale Correlation	N per item
6-1	4.537	0.287	.77	313
6-2	4.581	0.243	.71	313
6-3	4.511	0.352	.59	313
6-4	4.636	0.244	.56	313
6-5	4.556	0.266	.76	313
6-6	4.524	0.275	.70	313

Table 4:53 Descriptive statistics of the final Item Analysis in the Six-factor scale

Scale	1	2	3	4	5	6
N of items	7	42	11	10	6	13
N of examinees	313	313	313	313	313	313
Mean score	4.592	4.494	4.574	4.555	4.560	4.558
Variance	0.108	0.068	0.101	0.089	0.090	0.129
Std. Dev.	0.329	0.261	0.318	0.299	0.300	0.359
Skew (Sk)	-0.524	-0.400	-0.674	-0.386	-0.530	-0.540
Kurtosis (Ku)	-0.517	-0.062	-0.289	-0.728	-0.380	-0.399
Cronbach Alpha Coefficient	0.730	0.917	0.820	0.763	0.823	0.769

The Descriptive Statistics in Table 4:53 show that the overall reliability of the items per dimension is highly acceptable with Cronbach Alpha Coefficients of 0.730, 0.917, 0.820, 0.763, 0.823, and 0.769 respectively, (Higher than the acceptable level of 0.70.)

4.2.3 Testing the BPMCAM

The BPMCAM can be used as a diagnostic instrument and should be able to distinguish between different sample groups, i.e. organizations or business units within organizations where Business Process Management is managed and maintained as a Critical Core Capability and in organizations or business units where it is not the practice. A hypothesis can therefore be postulated that the BPMCAM will show a significant level of acceptance if tested in organizations or business units where Business Process Management is managed and sustained as a Critical Core Capability and vice versa.

The first testing of the BPMCAM consisted of the comparison of two independent organizations that were classified as Organization "A" and Organization "B", where Organization "A" is seen as an organization where Business Process Management is managed and sustained as a Critical Core Capability and Organization "B" an Organization where the capability is not fully implemented yet. (Table 4.55 and Figure 4.1).

The second testing of the BPMCAM consisted of the comparison of the three Business Units within Organization "A". (Table 4.56 and Figure 4.3). The three Business Units were distinguished as:

- BU 1: Managing all Small and Medium process enhancements;
- BU 2: Managing Large process enhancements; and
- BU 3: Customer Servicing.

The third testing of the BPMCAM consisted of the comparison of the three Business Units (Individually) within Organization "A" with Organization "B" (Global) to determine if individual business units in an organization practicing Business Process Management will rate higher per dimension than an organization where Business Process Management is not embedded. (Figure 4.2)

The Biographical Information of the sample groups is shown in Table 4.54

Table 4.54 Biographical Information – Organizations "A" and "B"

BIOGRAPHICAL INFORMATION	ORGANIZATION "A"	ORGANIZATION "B"
GENDER		
Male	22	15
Female	19	4
YEARS OF PROCESS-RELATED EMPLOYMENT		
Maximum Years	17	15
Minimum Years	3	1
Average Years	9.8	6.5
AGE		
Maximum Years	61	68
Minimum Years	29	25
Average Years	43	44
QUALIFICATION		
Secondary school	0	0
Std. 10 or equivalent	1	0
Post-school certificate/diploma	5	3
National Diploma/National Higher Diploma	2	10
Bachelor's degree or equivalent	14	6
Honours degree or equivalent	13	1
Master's degree or equivalent	6	0
Doctoral degree or equivalent	0	0
POSITION		
Administrative Officer	0	2
Business Analyst	5	0
Compliance Officer	0	2
Consultant	2	0
Engineer	0	0
Financial Officer	0	4
General Manager	1	2
Management	0	0
Medical Officer	0	0
Process Administrator	6	0
Process Analyst	11	0
Process Custodian	9	0
Process Engineer	0	0
Process Owner	2	0
Project Manager	4	0

Scientist	0	0
System Analyst	1	0
Teacher/Lecturer	0	0
Work-study Officer	0	0
Other	0	10
ECONOMIC SECTOR		
Agriculture, forestry and fishing		
Community, social and personal services		
Construction		
Electricity, gas and water		
Financial, insurance, real estate and business services	41	
General government services		
Manufacturing		
Mining and quarrying		
Transport, storage and communication		
Wholesale, trade and retail		20

Table 4.55 Mann-Whitney t-test between Organizations "A" and "B"

Variable	Mean		Standard Deviation		F-Levene Value	P-Value
	A	B	A	B		
Criteria 1: Strategy	4.0418	2.6357	0.4265	0.4715	0.78	0.3800
Criteria 2: People and Structure	3.9348	2.5523	0.2940	0.3546	0.29	0.5904
Criteria 3: Process Architecture	4.1885	2.2845	0.3535	0.5945	4.41	0.0400
Criteria 4: Systems and Information Architecture	4.2097	2.8939	0.4176	0.5728	2.25	0.1385
Criteria 5: Process Optimization	3.9174	2.4808	0.3506	0.5734	8.09	0.0061
Criteria 6: Standards and Measurement	4.1789	3.5750	0.4540	0.4240	0.18	0.6771

The statistics in Table 4.55 shows that Organization "A" had a higher Mean than Organization "B" in all six criteria. The results therefore prove that the measurement instrument (BPMCAM) measures what it should measure as the result was expected due to the fact that Organization "A" is the organization where Business Process Management has been implemented and sustained as a Critical Core Capability for more than four years prior to the measurement. Figure 4.1 illustrates the Statistical Comparison between the two organizations and the 100% profile of the BPMCAM more visually.

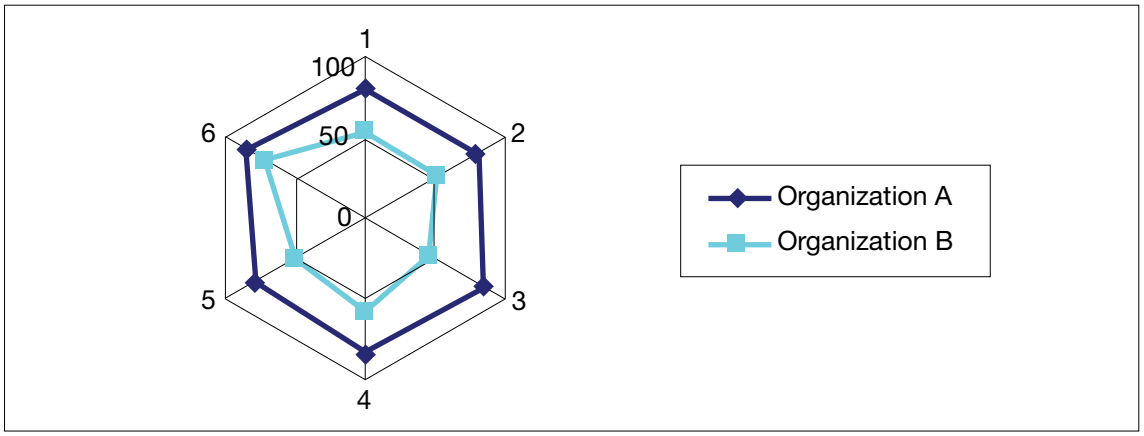

Figure 4.1 Statistical Comparison between Organization "A" and Organization "B" compared to the BPMCAM 100% profile

Table 4.56 Mann-Whitney t-test between Three Business Units in Organization "A"

Unit Comparison	Mean			Standard Deviation		
	BU 1	BU 2	BU 3	BU 1	BU 2	BU 3
Criteria 1: Strategy	4.0159	3.9323	4.2198	0.3068	0.5115	0.3120
Criteria 2: People and Structure	3.7494	3.9755	4.0036	0.2115	0.3471	0.2099
Criteria 3: Process Architecture	3.8687	4.3301	4.2028	0.5023	0.2104	0.2706
Criteria 4: Systems and Information Architecture	3.8667	4.2000	4.4615	0.3742	0.4190	0.2599
Criteria 5: Process Optimization	3.6496	3.9555	4.0473	0.2750	0.3967	0.2210
Criteria 6: Standards and Measurement	3.9444	4.2632	4.2179	0.4640	0.5101	0.3146

The statistics in Table 4.56 and Table 4.55 firstly show that all three the Business Units in Organization "A" had higher Means for all criteria than that of Organization "B" (See Figure 4.2 for comparison between Organization "A" Business Units and Organization "B" with BPMCAM 100% profile). This confirms the reliability of the instrument as it is expected that, even as individual units, Organization "A's" units should measure as the "Organization" with the stronger Business Process Management capability. The statistics further shows the difference in-depth of implementation and sustainability between the three Business Units regarding the different criteria (See Figure 4.3 for comparison of Organization "A" Business Units with BPMCAM 100% profile, i.e.:

- Business Unit "1" has shown lower Means than both the other two units in all criteria;
- Business Unit "2" has shown higher means for criteria 3: Process Architecture and criteria 6: Standards and Measurement; and
- Business Unit "3" has shown higher means for criteria 1: Strategy; criteria 2: People and Structure; criteria 4: Systems and Information Architecture; criteria 5: Process Optimization.

After analysis and discussion of the results with Organization "A" the following underlying differences between the three units were identified to substantiate the validity of the results:

- Business Unit "1" :
  - The unit is a support function for enterprize-wide incremental changes and involvement can vary from a few hours to a few months;
  - The unit has been restructured over the past few months and has been without a dedicated manager overseeing the function and supporting the business model;
  - Only focus on incremental improvements that do not require registering of a project or the following of Project Management principles;
  - Perform improvements enterprize-wide and no staff member is dedicated to any specific business unit;
  - Improvements does not include any systems-related changes;
  - Scope of responsibility in improvement exercises does not include the setting of standards or measuring of results as these specific functions are performed by the business unit that they do the improvement for; and
  - Unit not measured against process performance or profitability of process over any timeframe;

- Business Unit "2":
  - The unit is a support function for enterprize-wide major changes and initiatives;
  - Involvement is always from a few months to more than a year;
  - Strong Project Management principles are followed in all initiatives;
  - All initiatives focus on implementing "New' processes and processes are 100% Taxonomy-linked;
  - Every project includes setting, sign-off and measuring of standards through all phases of the project; and
  - Unit not measured against process performance or profitability of process over any timeframe.

- Business Unit "3"
  - The unit is a fully-fledged "Customer Owning" "Profit Making" business unit that are responsible and involved full-time in management of all processes owned by the unit;
  - The unit has the most stable and fully populated "Business Process Management"-related organizational structure;
  - Profitability of processes are constantly measured; and
  - The unit has been rated one of the most profitable business units in Organization "A" for the past two years.

During discussions with Organization "B", management agreed with the results and confirmed that they expected criteria 4: Systems and Information Architecture and criteria 6: Standards and Measurement to measure slightly higher than the other criteria as during 2007 they started the implementation of several initiatives regarding their IT systems as well as measurement of certain processes and functionalities.

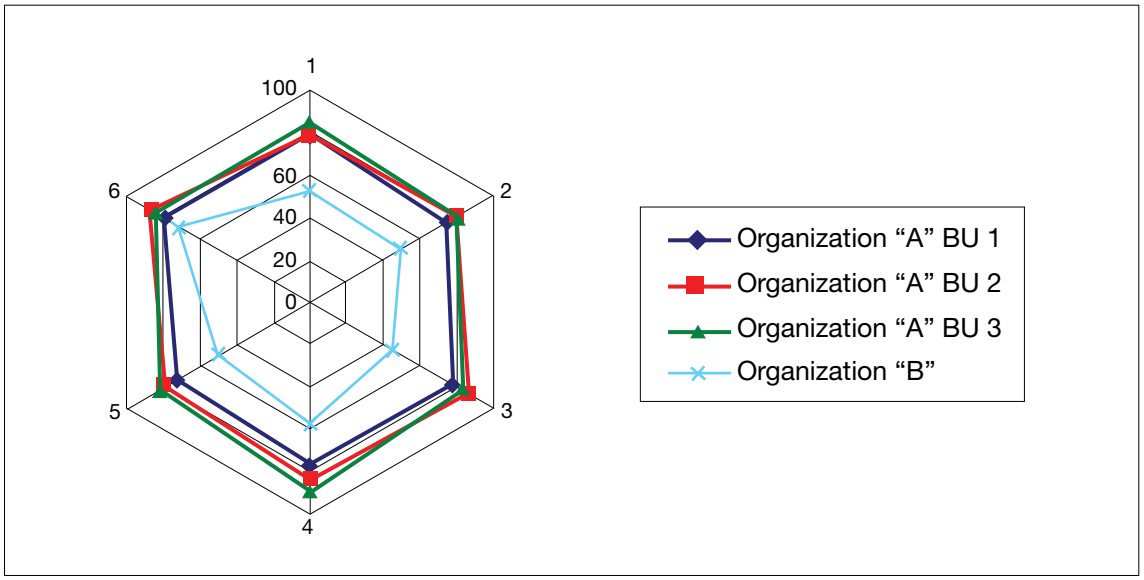

Figure 4.2 Statistical Comparison between Organization "A" Business Units and Organization "B" compared to the BPMCAM 100% profile

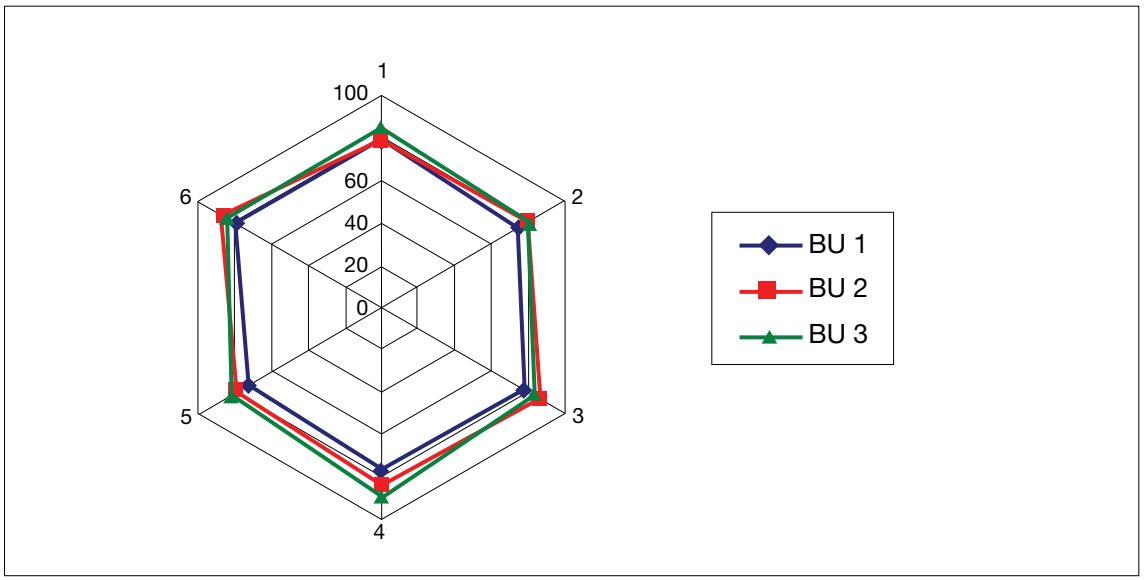

Figure 4.3 Statistical Comparison between Organization "A's" Business Units compared to the BPMCAM 100% profile

4.3 CONCLUSION

The primary objective of this study was to develop an assessment model to measure Business Process Management as a Critical Core Capability in an organization. The results and findings as reported in this chapter are evidence that the primary objective has been achieved and that the model discriminates between organizations where Business Process Management has been implemented as a Critical Core Capability and organizations where it has not been implemented. The model further proved that it can discriminate between business entities/units within one organization to determine their level of capability with regard to the identified criteria.

In the endeavor to achieve the primary objective the researcher performed an in-depth literature study and utilized the opinions of experts involved in the subject field for many years. Ethical research principles as well as the research methodology and design as described in Chapter 3 were followed and the results were reported unambiguously by the researcher.

Chapter 4 explains the application of the analysis tools (item and factor analysis) in the analysis and interpretation of the data. Data is reported after every factor analysis and the results of both the analysis of the 93 items and the different clustering's discussed in full by the researcher.

The researcher after the interpretation of the results on the dimensions "Optimizing and improving current business processes" and "Continuous improvement of business processes" combined the two criteria and further analysis were performed. The two criteria were combined and included in the final measurement instrument as one criteria i.e. "Optimization of business processes"

The results obtained via the analysis of the final six dimensions show that the overall reliability of the items per dimension is highly acceptable with Cronbach Alpha Coefficients of 0.730, 0.917, 0.820, 0.763, 0.823, and 0.769 respectively.

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

5.1 INTRODUCTION

In the previous chapter the application of the analysis tools (item and factor analysis) in the analysis and interpretation of the data as well as the validity and reliability of the items is explained. The ability of the measurement model to discriminate between different organizations and business units' Business Process Management competency is confirmed via the results on the testing of the BPMCAM in two organizations.

In this chapter the researcher re-assesses the research questions set in chapter 1 for this research. The re-assessment is performed to determine if the researched questions have been realized and the required outcomes met by the research.

The abundance of information on Business Process Management evident during the research process emphasizes the importance of this functionality. In addition, significant progress has been made in the application of Business Process Management as a tool for increasing efficiency, reducing costs, improving process effectiveness and innovation, as well as standardizing and harmonizing business processes.

Literature that focuses on Business Process Management as a Critical Core Capability and management function inclusive of strategy, structure, process, people, and implementation methodologies is limited and mostly only investigates subsets of the scope of what a Critical Core Capability usually encompasses. It is clear that an holistic focus or view of Business Process Management as a Critical Core Capability within the researched literature is lacking.

Within the organizational behavior and organizational design literature there is a constant reminder to management that although changes to business processes are driven by "the organizations' pursuit for excellence" the individual's social and psychological needs must be recognized and accommodated in the new process and job design. It is clear that in this "pursuit for excellence" that organization behavior factors can be overlooked or ignored. Kreitner and Kinicki, (2004:274) therefore advise "caution and situational appropriateness." The utilization of a recognized approach is therefore advocated by authors such as Kreitner and Kinicki, (2004:267-275), Robbins, (1998:516-525) and Cummings and Worley, (2005:331-347).

The primary objective of this study was to develop a Business Process Management Competency Assessment Model based on the Critical Success Factors identified to:

- Measure on a specific scale, within the identified Critical Success Factors, the readiness of an organization to implement process management as a Critical Core Capability;
- Measure on a specific scale, within the identified Critical Success Factors, the capability of an organization to maintain process management as a Critical Core Capability once implemented.

Secondary objectives were also formulated to support the primary objective in facilitating the research process. To conclude on the answers to the secondary objectives a summary is given in the next section.

5.2 CONCLUSION ON ANSWERS TO RESEARCH QUESTIONS

The research questions were answered in the previous chapters, i.e. Literature Review (Chapter 2) and Results and Findings (Chapter 4).

Research Question 1:

What must be implemented, in terms of strategies, governance, enterprise architecture and process optimization, to ensure that organization culture, people's behavior and work environment will be conducive to the successful establishment and maintenance of Business Process Management as a Critical Core Capability of an organization?

In the literature study (Chapter 2), Tucker (1999:8) acknowledges the changed view in Business Process Management with his statement, "Successful Business Process Management is therefore as much about raising the performance and capabilities of people, systems and structures as improving the process".

Devane (2004:130) displays a clear understanding and view of the scope of Business Process Management when he states that "to sustain an organization, several performance factors must be present and actively maintained within an organization's internal environment, i.e. strategy, process, information, learning, human resources practices, culture, structure and relationships."

In the article Business Process Management: A Global View, Khan (2007) states that Business Process Management "is more than workflow and integration." He further specifies that Business Process Management "needs to be supported and leveraged by management, implemented by IT, optimized by the business analyst and utilized by the workforce at large. Only by enabling each stakeholder to play their role effectively in different aspects of a Business Process Management environment can a business achieve agility while keeping all parties motivated and aligned." When observing Business Process Management technologies, Khan (2007) states that "organizations need to assess the ability of the solution to support distributing responsibilities across a team with skills that range from IT developers to business analysts to business sponsors. Organizations that operate under this shared model have seen tremendous benefits, such as reduced development backlog faster, reduced risk deployments and improved operational processes that generate real business value and impact positively on the bottom line."

Although not in abundance, sufficient proof exists in the literature that the realisation had dawned on researchers, as well as business owners, that Business Process Management should include more than just process enhancements. Since the late nineties, increasing evidence is found in literature, as well as in the corporate environment, that a more holistic view of the Business Process Management functionality should be taken. Therefore, Business Process Management as a Critical Core Capability of an organization should include all the facets inherent to any other Critical Core Capability in an organization.

The researcher originally proposed eleven (11) criteria, thirty (30) Critical Success Factors, and eighty eight (88) Guiding Principles. Only one guiding principle was rated by respondents as not being relevant. The eleven criteria were then redefined into seven criteria constituting 93 final items. The final BPMCAM comprises six criteria (two criteria combined) and 90 items. The fact that only three items (out of 90 items) had factor loading lower than the acceptable level indicates that respondents viewed the model and individual items as extremely valid.

The researcher therefore in terms of the content validity ratio of more than 0.50 and factor analysis with Cronbach Alpha Coefficients of 0.730, 0.917, 0.820, 0.763, 0.823, and 0.769 respectively concluded that the items and criteria are viewed as valid and thus representative of the Critical Success Factors that should be present in the Business Process Management area of an organization.

Research Question 2:
Will the understanding of the concepts, contents, and importance of Business Process Management contribute to acceptance on all levels in the organization of responsibilities and accountabilities of the concept and initiatives?

The latest Business Process Management study carried out by IDS Scheer and the IT Market Analysis Consultant, PAC, published in the Business Process Report 2006, reveals that "the concept of Business Process Management has become indispensable in mid-sized and large organizations. Eighty percent of the organizations surveyed are deeply or very deeply committed to the concept of Business Process Management. Compared with the results of previous years, the proportion of organizations that are deeply involved with the concept has hit a record high."

"Almost seventy-five percent of the organizations surveyed consider the use of a Business Process Management tool to be important or critical. By far the most important benefit factors are still increasing efficiency, reducing costs and improving process effectiveness and innovation, as well as standardizing and harmonizing business processes. It seems logical that the most important strategic objectives of Business Process Management are performance optimization and cost reduction."

"Key to the success of Business Process Management is sustained support from management. Ninety-two percent of the organizations surveyed consider management support for Business Process Management to be important or critical. Business Process Management is therefore clearly emphasized as a management task."

"The study very clearly shows the demand for a reliable manager for processes and process management, a 'Chief Process Officer', who has a central responsibility and is able to make decisions concerning Business Process Management. These results make it clear that the concept of Business Process Management is already instilled in people's minds as a management task; what is still lacking in some organizations is the practical implementation," said Helmut Kruppke, CEO of IDS Scheer AG (IDS Scheer, 2006)."

"The basic understanding of Business Process Management has matured from the initial "Improve and Move" mentality to the introduction of permanently appointed management employees to sustain the functionality" as noted in the evidence produced by IDS Scheer and other authors in

the research literature. “Continuous and sustained benefits are only attainable when the end-to-end business process function is intact, properly managed and its magnitude understood by the whole organization.”

Based on the above literature evidence it is clear that Business Process Management has been establishment as an autonomous functionality and a management focus area. The literature further suggests deep commitment and assessment of the function as being critical to the organization’s in question. It is the researchers’ opinion that the labelling if Business Process Management as “critical” and the display of “deep commitment” can only realize through full understanding of such function – and that through the full understanding of the concepts the acknowledgement and acceptance of roles and responsibilities have been facilitated.

Within the final ninety Critical Success Factors various roles are discussed i.e. BPM teams, stakeholders, line managers, managers, core process owners, process custodians, analysts, consultants, steering committees, business units, senior management and the workforce, to name some. As far as related responsibilities are concerned the following are demarcated i.e. decision making, continuous process improvements, control, ownership, quality assurance, risk management etcetera.

The validity ratios of the six criteria as well as the factor loadings per individual items as discussed in the previous chapter suggests an acceptance of the identified critical success factors in general as well as the specific factors assigning specific roles and responsibilities to individuals, groups, the organization as well as all stakeholders.

Research Question 3:
How and how often should organizations assess individual business units as well as the organization as a whole, in terms of the readiness and capabilities regarding the effective management of Business Process Management functionalities?

Porter and Tanner (2004:4-9) refer to self-assessment as “an organizational health check, based on a comprehensive internal assessment of organizational activities and their performance, as well as stakeholder perception. It therefore does not only relate to an organization’s operational activities, but also its achievements. In essence, self-assessment is not only a measurement tool for continuous improvement; it also provides an excellent opportunity for integrating business or organizational excellence into normal business activity.”

“Self-assessment is conducted to measure improvement progress and potential. Each of the award criteria provides a framework of standardized items against which an organization can measure its performance. This type of standardization allows best-in-class comparative process and performance analysis.”

Furthermore, Porter and Tanner (2004:4-9) suggest that “assessments are conducted frequently to ensure the optimum application of the functionality that is subject to assessment. Using assessments as a management tool to improve and sustain a competitive edge to the organization, both negative and positive aspects of such an organization should be identified and analyzed.”

Twenty-one (23% of the total) of the final ninety Critical Success Factors identified with content validity ratio's of more than 0.50 focus on activities that can be classified as "measurement" or "assessment". The "assessment" actions proposed Include review, measurement, evaluation, assessment, measurable standards, performance standards and control related to the following areas; strategy, people performance, people awareness, process performance, people and process capabilities, process life cycle, rules and goal statements and review plans. The above clearly indicates not only "how" assessment should be done but also "what" activities should constitute assessment and "which" activities should be assessed.

As for the "timing" and "frequency" of assessment of the above mentioned activities Porter and Tanner (2004:4-9) proposes that the purpose of the assessment will determine "timing" and "frequency". They further are of the opinion that assessment is a "health check" and should be conducted frequently.

The final results further indicated that the "People and structure" criteria had the highest Cronbach Alpha Coefficient underlining the importance of the human element in the model.

To conclude - the researcher is of the opinion that the BPMCAM provides sufficient direction regarding the applicable activities within the Business Process Management function that should be assessed. "Timing" and "frequency" of assessments should be determined in terms of the organization's specific utilization of any measurement model i.e. assessment as a health check, assessment in terms of annual reviews or assessment with regards to award winning.

5.3 VERIFICATION OF THE BPMCAM BY EXPERTS

The following research question had to be answered first before the actual BPMCAM could be designed.

"What must be implemented, in terms of strategies, governance, enterprise architecture and process optimization, to ensure that organization culture, people's behavior and the work environment will be conducive to successfully establish and maintain Business Process Management as a Critical Core Capability of an organization?"

From the research, a comprehensive framework was compiled that facilitated the compilation of 11 criteria, 30 Critical Success Factors, and 88 Guiding Principles (See Chapter 7 Annexure "A").

Lawshe's (1975) "Content Validity Technique" was applied to the criteria, Critical Success Factors and Guiding Principles, which the researcher used to determine the perception experts had of the model. Eleven (11) criteria (weighted to a total of 100%), thirty (30) Critical Success Factors (100%), and eighty eight (88) of the Guiding Principles (99%) included in the validity questionnaire on Business Process Management as a Critical Core Capability of an organization have a content validity ratio of more than 0.50.

5.4 CONCLUSION AND ANSWER TO THE PRIMARY OBJECTIVE OF THE BPMCAM

The BPMCAM has a five-factor scale and a total of 90 items that were clustered according to the following six criteria (See Chapter 4 Table 4.45).

Table 5.1 Final factor scale for the BPMCAM

Factor 1 Strategy	Factor 2 People and Structure	Factor 3 Process Architecture	Factor 4 Systems and Information Architecture	Factor 5 Process Optimization	Factor 6 Standards and Measurement
7 Items	43 Items	11 Items	10 Items	13 Items	6 Items

The final scale and items were derived by applying the research process discussed in Chapter 3 and the statistical analysis techniques such as Item Analysis via the SAS, 1997 software and Factor Analysis via the software package BMDP Statistical Software, 1993, on the initial 11 Criteria, 30 Critical Success Factors, and 88 Guiding Principles that were developed by the researcher and verified by Business Process Management experts.

The results from the empirical research and statistical analysis found in Table 4:53 of the Descriptive Statistics (Chapter 4) show that the overall reliability of the items per dimension is highly acceptable with Cronbach Alpha Coefficients of 0.730, 0.917, 0.820, 0.763, 0.823, and 0.769 respectively (higher than the acceptable level of 0.70).

The results in table 4.52 (Chapter 4) shows that the factors are highly inter-correlated as can be expected from an interdisciplinary construct of factors that are systemic in nature.

From the results it was concluded that the theoretical construct of the BPMCAM's framework, as well as the items identified and assessed by experts, are viewed as valid and thus acceptable to be used in an assessment tool and therefore also acceptable to be utilized in the BPMCAM (See paragraph 4.1 and Table 4.2 in Chapter 4 for details).

It was however necessary to prove that the instrument could distinguish process management maturity between different organizations as well as between different business units of an organization.

5.5 LIMITATIONS OF THE PRESENT STUDY

One should be aware of the limitations of the existing research and the influence this might have on the expert opinion derived from the study.

The study was undertaken to identify an holistic model on a strategic and tactical level that management can utilize to identify strengths and weaknesses within their organization and/or business units, specifically with reference to the health state of the Business Process Management functionality based on criteria, Critical Success Factors and Guiding Principles.

No limitations regarding the thesis as such have been identified but the researcher noticed the following tendencies:

- Due to the relatively short period since Business Process Management as a Critical Core Capability has been introduced by a limited number of South African Organizations knowledge and insight with regard to the holistic picture of the functionality is still limited; and
- A further limitation identified by the researcher is the bias against a principle such as the utilization of consultants. This tendency is directly linked to the uncertainty that the South African workforce

currently experiences. This could have impacted the assessment and relevancy of certain items that have been identified as extremely important in the material researched but has not been positively assessed by the respondents.

5.6 CONTRIBUTIONS OF THE PRESENT STUDY

Despite the abundance of quality research in Business Process Management practices, limited research has been done on Business Process Management as a Critical Core Capability applied within the entire management environment, including strategy, structure, process, people and improvement. Most Business Process Management literature still only see Business Process Management as a tool for process improvement and not as a management tool to manage and maintain Business Process Management as a Critical Core Capability. While some researchers have begun to explore Business Process Management as a management function, the total scope of Business Process Management as a Critical Core Capability inclusive of strategy, structure, process, people and improvement has not been fully explored. That gap was researched and addressed in this study.

The findings and results obtained from this study add valuable new perspective to the field of Business Process Management as a Critical Core Capability of an organization which in turn adds a comprehensive framework to guide further research in this field.

This study enabled the development of an holistic assessment model (BPMCAM) that can successfully measure the level of the Business Process Management functionality as a Critical Core Capability of an organization.

The BPMCAM is able to measure the existing level of Business Process Management and also identify the health status of such functionality within the different Business Units of an organization that has adopted and implemented Business Process Management as a Critical Core Capability.

The BPMCAM will also indicate the level of readiness of an organization to implement Business Process Management as a Critical Core Capability. The results of the initial assessment will indicate whether an organization is competent or lacking competence in the different criteria and Critical Core Capabilities.

The BPMCAM has been developed to focus on any type of organization on a strategic and management level rather than an operational industry level.

5.7 RECOMMENDATIONS FOR FURTHER RESEARCH

The comprehensive framework of the BPMCAM suggests in itself a wide range of research possibilities whilst numerous areas within Business Process Management as a Critical Core Capability are still unexplored.

This study has identified further, by means of the comprehensive framework, numerous areas within Business Process Management as a Critical Core Capability that are still unexplored. These include:

- The classification of the Criteria, Critical Success Factors, and Guiding Principles on a scale of importance regarding:
  - What should be implemented first;
  - What would afford the organization the quickest results;

  - Which Criteria, Critical Success Factors and Guiding Principles constitute the highest basis for success;
- What would be the cost, time and resource requirements to implement Business Process Management as a Critical Core Capability in an organization;
- The allocation of specific weightings to Criteria, Critical Success Factors and Guiding Principles;
- An in-depth research on an operational level on every Guiding Principle;
- The interdependency between the different Criteria, Critical Success Factors and Guiding Principles;
- A comparison between Business Process Management as a Critical Core Capability and the other Critical Core Capabilities of an organization; and
- The measurement of the contribution of Business Process Management as a Critical Core Capability to the success and profitability of an organization.

Given the scarcity of research on Business Process Management as a Critical Core Capability of an organization there is a tremendous opportunity for theory building and development of detailed criteria regarding specific measurement tools within the six proposed criteria.

5.8 CONCLUSION

This chapter concludes that the research questions as set in chapter 1 for this research have been realized and that the required outcomes were met by the research. The final scale and item analysis suggests that the overall reliability of the items per dimension is highly acceptable with Cronbach Alpha Coefficients of 0.730, 0.917, 0.820, 0.763, 0.823, and 0.769 respectively (higher than the acceptable level of 0.70). The chapter finally concludes with the contribution of this study and the recommendations for further research.

In conclusion it is evident that South African organizations are increasingly feeling the strain to remain competitive in the global economy. New products have been ruled out as a sustainable competitive edge due to the speed of copying any product in this highly technological world. Business Processes and Business Processes Management as a Critical Core Capability have however been identified and proven as a sustainable competitive edge by numerous authors and organizations.

It is also very clear from this study that none of the identified Criteria, Critical Success Factors, and Guiding Principles are sustainable in isolation. Sustainability is derived by an holistic view based on the principles of synergy (The functionality of 'the whole always exceeds the sum of it's parts'). The model must encompass the management functions, i.e. planning, decision making, leading, organizing and controlling and should further be supported by a proper organizational framework that focuses on the principles of effective and efficient utilization of cost and time, as well as the performance of all resources.

Finally the results regarding the "People and structure" criteria underline the importance of the human element in the organization as well as the model.

The utilization of the BPMCAM can assist organizations to assess and improve their process effectiveness on a continual basis – in this lies the true value of this study.