

## **DEVELOPMENT AND IMPLEMENTATION OF THE SOUTH AFRICAN CONSTRUCTION EXCELLENCE MODEL (SACEM)**

**Sihle Dlungwana**

Research Engineer, The Building and Technology Division, Council for Scientific and Industrial Research (CSIR),  
Pretoria, Gauteng, South Africa

**Xolani H. Nxumalo**

Research Engineer, The Building and Technology Division, Council for Scientific and Industrial Research (CSIR),  
Pretoria, Gauteng, South Africa

**Steve van Huysteen**

Project Manager, The Building and Technology Division, Council for Scientific and Industrial Research (CSIR),  
Pretoria, Gauteng, South Africa

**Pantaleo D. Rwelamila**

Professor, The Graduate School of Business Leadership, University of South Africa, Pretoria, Gauteng,  
South Africa

**Canon Noyana**

Managing Director, Noyana Management Consultants cc, Johannesburg, Gauteng, South Africa

### **ABSTRACT**

The focus of the paper is on the current progress of a research project of the Council for Scientific and Industrial Research's (CSIR) Division of Building and Construction Technology in developing a performance assessment model for contractors. The South African Construction Excellence Model (SACEM) is based on the South African Excellence Model (SAEM), an internationally recognised framework for business performance assessment.

The paper describes the some problems caused by poor performance of contractors in South Africa. The Construction Industry Development Board (CIDB), an important force driving the construction industry reforms, is described. In attempting to provide solutions to challenges facing contractors the paper introduces the South African Construction Excellence Model. The model's basic structure, function, benefits and its relationship with industry development strategy is elaborated. The promotion of "best practice" culture is advocated by the authors as a critical aspect of improving overall performance of contractors. SACEM is seen as a relevant tool, a starting point for adopting this a culture of excellence. The model's long-term objective is to contribute to the promotion of a culture of business performance excellence in the construction industry by complementing many existing, and possible future, performance improvement programmes.

### **KEY WORDS**

Construction Industry Development Strategy, Best Practices, Contractor Performance Assessment, Performance Excellence, and Competitiveness.

# 1. INTRODUCTION

## 1.1 The South African Construction Industry Environment

The construction industry is an important player in the economy of South Africa. Although the industry's current contribution to the gross domestic product has shrunk to approximately 3%, compared to 7% in the 1970's, it remains an important economic sector. According to the Department of Public Works (1999), the industry contributes 35% to the total gross domestic fixed investment and employs approximately 230,000 employees. The South African Government is the single biggest construction client, making up between 40% and 50% of the entire domestic construction expenditure.

The construction industry, however, faces some serious challenges in its endeavour to deliver infrastructure projects of the government effectively. The Department of Public Works (1999) reports, among other industry challenges, a sharp decline in employment the last 20 years, a steep decline in gross domestic fixed investment (GDFI), slow delivery of public sector projects due to poor capacity in both the public sector institutions and the contractors, low productivity and poor quality workmanship, and low profit margins for contractors.

Compounding these challenges has been the rapid globalisation of the South African economy. Large South African contractors in particular are increasingly expanding into offshore markets to grow revenues and to survive the current economic recession affecting the South African construction industry. This has meant that South African contractors need to be more competitive to match the level of performance of their counterparts operating in international markets.

To improve the current industry situation a government department, The National Department of Public Works (NDPW), was tasked to develop a remedial strategy. The launch of the framework document, in 1999 (DPW, 1999) was among the first decisive interventions aimed at addressing the situation, and set the tone for government's intention. Subsequently a Construction Industry Development Board (CIDB) Act was passed in 2000 thus establishing a statutory body aimed at driving an integrated Construction Industry Development strategy. The CIDB has established the construction industry development strategy, performance targets and key performance indicators. The promotion of best practice standards constitutes a critical component of the industry development strategy.

In strong support of the industry development strategy, the Council for Scientific and Industrial Research's (CSIR) Building and Construction Technology Division is developing a model for assessing an overall performance of contractors with a view to promoting best practice standards.

## 1.2 The Structure of South African Contractors

South Africa is fortunate to have well established contracting sector as part of its construction industry. Notwithstanding this fact, there are many serious challenges still facing contractors. A simplified structure of South African contractors can be illustrated as shown in Table 1.

**Table 1: Structure of the Contractors in South Africa**

| <b>CATEGORY</b> | <b>ECONOMIC SECTOR</b> | <b>ANNUAL TURNOVER</b> | <b>MANAGEMENT SKILLS LEVEL</b> |
|-----------------|------------------------|------------------------|--------------------------------|
| SMALL           | FORMAL                 | LESS THAN R10M         | VERY POOR & FAIR               |
|                 | INFORMAL               |                        |                                |
| MEDIUM          | FORMAL                 | R10M – R50M            | POOR, FAIR, GOOD & VERY GOOD   |
|                 | INFORMAL               |                        |                                |
| LARGE           | FORMAL                 | ABOVE R50M             | FAIR, GOOD & VERY GOOD         |

This paper mainly deals with construction industry challenges as seen from the perspective of contractors in their varying sizes, capabilities and sophistication.

## **2. POOR CONTRACTOR PERFORMANCE AND ITS CAUSES**

Many problems are faced by contractors when delivering construction projects. As a result poor contractor performance, as characterized by poor work quality and low productivity, is common in the industry.

In a survey conducted among members of the South African Property Owners Association (SAPOA) to investigate the client's perception relative to contractors' performance, Smallwood (Smallwood, 2000) found the predominated problems to be rework and poor productivity and poor quality.

Smallwood concluded that the causes of poor contractor performance, as perceived by clients, were a lack of concern for the environment, late information, poor management of the design activities, inadequate or poor planning, poor management and low skills level among the workers.

Other writers (Allens, 1994; Henry, 1994; Lobelo, 1996) strongly concur with Smallwood's analysis. Furthermore, they identified problems to be cost over-runs, rework, late completion, unacceptably high accident rate, insensitivity to environmental considerations, poor work practices and adversarial relationships.

A common thread running through all these cases is the failure of many contractors to fully acknowledge the significance of some key construction issues that seriously affects contractor performance, such as integration of the design and construction process, as well as the quality management process.

## **3. BUSINESS PERFORMANCE EXCELLENCES AND THE ROLE OF A SUPPORTIVE CULTURE**

Overall business performance has been a widely researched subject throughout the world (Dlungwana, 2000; Peters, 1985; Porter, 1980). It is generally accepted that organisations with entrenched culture of continuous improvement achieve high levels of business performance. Performance excellence is the highest possible level of performance that can be reached by organisations that incorporate best practices in all their processes and activities, thus becoming highly effective, efficient and competitive.

In recent years many industry development programmes have been conceptualised, developed and implemented. Such programmes have involved many industry stakeholders including government departments, particularly those involved in public works and infrastructure development. Many countries such as the United Kingdom (Latham, 1994; Egan, 1998), Australia and Singapore have made remarkable progress in these programmes. While full impact of these programmes have not been fully understood, more and more countries have been inspired to go down this road.

The authors of this paper argue that to raise the levels of competitiveness, contractors need to increase the use of performance assessment tools as a means of supporting performance improvement programmes. Excellence models are tools aimed at addressing overall performance of organisations and can be successfully implemented if supported by an appropriate organisational culture (Brown, M.G., 1996). Nadler and Tushman (1988) suggest that organisational change could be considered to be operating at two levels. The first being fundamental large-scale change in the organisation's strategy and culture and the second level being concerned with changes that improve an organisation's performance, yet do not change the organisation at the fundamental level. Many other scholars (Beckhard and Harris, 1987; Griffis, 1992; Low and Chan, 1998) strongly emphasised the need for developing a supportive culture when embarking on performance improvement programmes.

To realize the vision of performance excellence for contractors, a performance assessment tool, underpinned by a supportive industry culture and relevant programmes, must be given a priority by the construction contractors.

## **4. THE SOUTH AFRICAN CONSTRUCTION EXCELLENCE MODEL (SACEM)**

The South African Construction Excellence Model (SACEM) is advocated as a tool most suitable to facilitate the culture of continuous improvement for contractors.

## 4.1 What is the South African Construction Excellence Model?

The South African Construction Excellence Model (SACEM) is a contractor performance assessment tool. But more than just a tool, it is a comprehensive, systematic model intended to promote the concept of 'total quality management' at both the corporate level as well as the construction site level. SACEM's approach to excellence is through systematic, continuous improvement of eleven key performance criteria. The model is diagnostic in its approach and does not provide a specific solution, only an indicative approach towards a solution. SACEM is strongly based on the principles of the South African Excellence Foundation's model - the South African Excellence Model (SAEM).

## 4.2 The Structure of the Model

The structure of SACEM is illustrated in figure 1. SACEM comprise of eleven performance assessment criteria, which are strongly linked to one another such that activities on the enabler side have a direct result on the supply side. For example, a deployment of a customer management system – an activity on the enabler side - will have an impact on the results side of the performance equation. Each criterion carries a score weighted according to its importance in helping a contractor achieve superior performance.

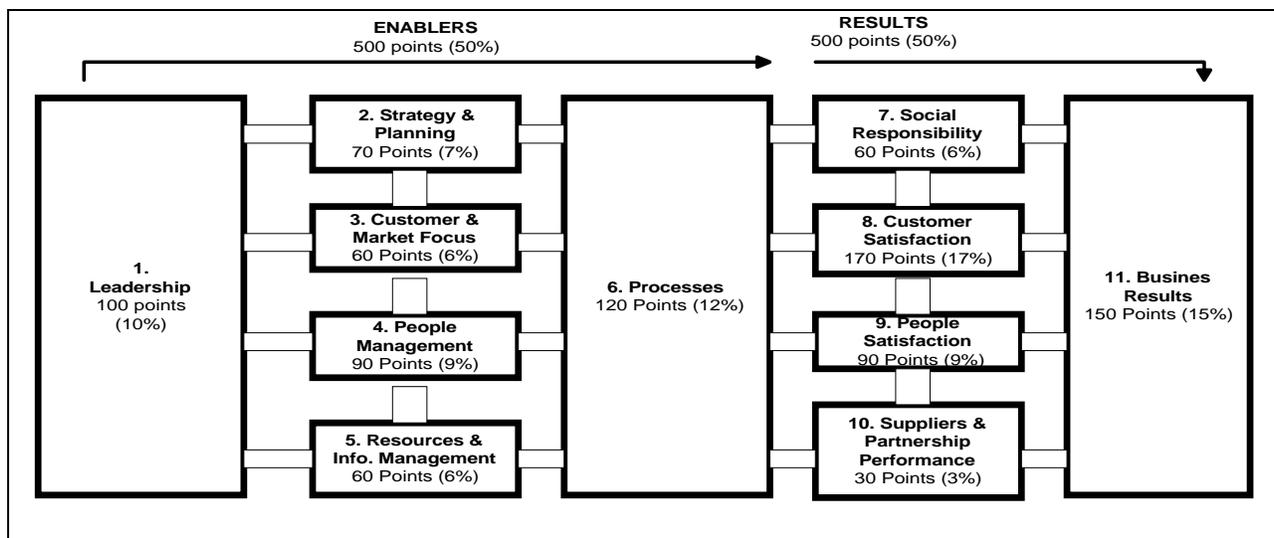


Figure 1: The Structure of SACEM

### 4.1 Leadership

Leadership relates to how the behaviour and actions of the executive team and all other leaders inspire, support and promote a culture of business excellence

### 4.2 Strategy and Planning

Strategy and planning relates to how management formulates, deploys, reviews and turns policy and strategy into plans and actions

### 4.3 Customers and Market Focus

Customer and market focus relates to how the contracting organization determines the needs, requirements and expectations; enhances relationships and determines satisfaction of customers and markets

### 4.4 People Management

People management relates to how the contracting organization releases the full potential of its people.

#### **4.5 Resources and Information Management**

Resources and information management relates to how the contracting organization manages and uses resources and information effectively and efficiently.

#### **4.6 Business Processes**

Business processes relates to how the contracting organization uses resources and information to support its plans. Business processes forms an important area of study in business management and improvement. This topic is very important for, without business processes, a contracting organization cannot deliver the required end-product

#### **4.7 Impact on Society**

Impact on society relates to what the contracting organization achieves in satisfying its local community and society. The criterion areas included are the society' perception of the organization and other additional measurements of the organization's impact on society

#### **4.8 Customer Satisfaction**

Customer satisfaction relates to what the contracting organization achieves concerning the satisfaction of its customers. Customer satisfaction assesses the customer's perception of the organization's products and services and other additional measurements relating to satisfaction of the organization's customers.

#### **4.9 People Satisfaction**

People satisfaction relates to what the contracting organization achieves concerning the satisfaction of its people. People satisfaction is assessed by measuring people's perception of the organization and other additional measurements relating to people satisfaction.

#### **4.10 Suppliers and Partnership Performance**

Suppliers and partnership performance relates to what the contracting organization achieves with its supplier and partner processes and relationships. This aspect of performance is assessed by measuring the organization's perception of its suppliers' and partners' performance and other additional measures relating to the performance of the organization's suppliers and partners.

#### **4.11 Business Results**

Business results relates to what the contracting 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 organization. Assessment should demonstrate the performance of the contractor as shown by results, trends, targets and comparison with competitors or 'best-in-class' organizations. Information on the relevance of these to those with a financial or other stake in the organization should also be presented.

### **5. HOW SACEM WORKS AND ITS RELATIONSHIP TO THE CONSTRUCTION INDUSTRY DEVELOPMENT STRATEGY**

#### **5.1 How SACEM is used to Assess Performance?**

The primary objective of performance assessment is to identify areas of improvement and strengths of the contractor' overall business and to focus improvement effort accordingly. SACEM systematically assesses the overall performance of a contractor using eleven performance criteria described in the previous section. Several questions relating to the overall performance of a contractor are asked under each criterion. Contractor's responses are scored on a 0-3 scale where 0 means that the activity is not done or has "not started", and 3 represent "fully achieved". The scores are aggregated out of a total possible score of 1000. Contractors that score close to, and up to

1000, are well managed and show good results. Information relating to how a contractor manages its overall business is captured in a questionnaire and in a report detailing all the necessary evidence is as proof of facts.

Areas of improvement as well as strengths of the contractor are summarised such that the necessary improvement action can be taken.

## 5.2 SACEM’s Relationship with the Construction Industry Development (CID) Strategy

Among the key components of the CIDB’s construction industry development (CID) strategy is the Star Grading System, which is aimed at promoting best practice in selected high-risk projects. The system makes use of an assessment process to evaluate current performance of contractors and allocate one or more stars to indicate the level of overall business performance of contractors. In terms of the grading system contractors scoring five stars can be regarded as “excellent” contractors that incorporate best practices. Such contractors can be regarded as having the lowest possible risk and capable of managing complex public and private projects relatively more effective than contractors with fewer stars.

In supporting the construction industry development strategy it is important that SACEM be integrated into the CID strategy. SACEM is intended for use, among other things, as a pre-qualification system for managing risk associated with contractors. SACEM, therefore, could be linked to the CIDB’s Star Grading System by converting SACEM scores into CIDB’s star grades. This critical link between SACEM and the CIDB processes is illustrated in figure 2. For this link to be established it is critical that a strong partnership between the CSIR and the CIDB form a strong partnership.

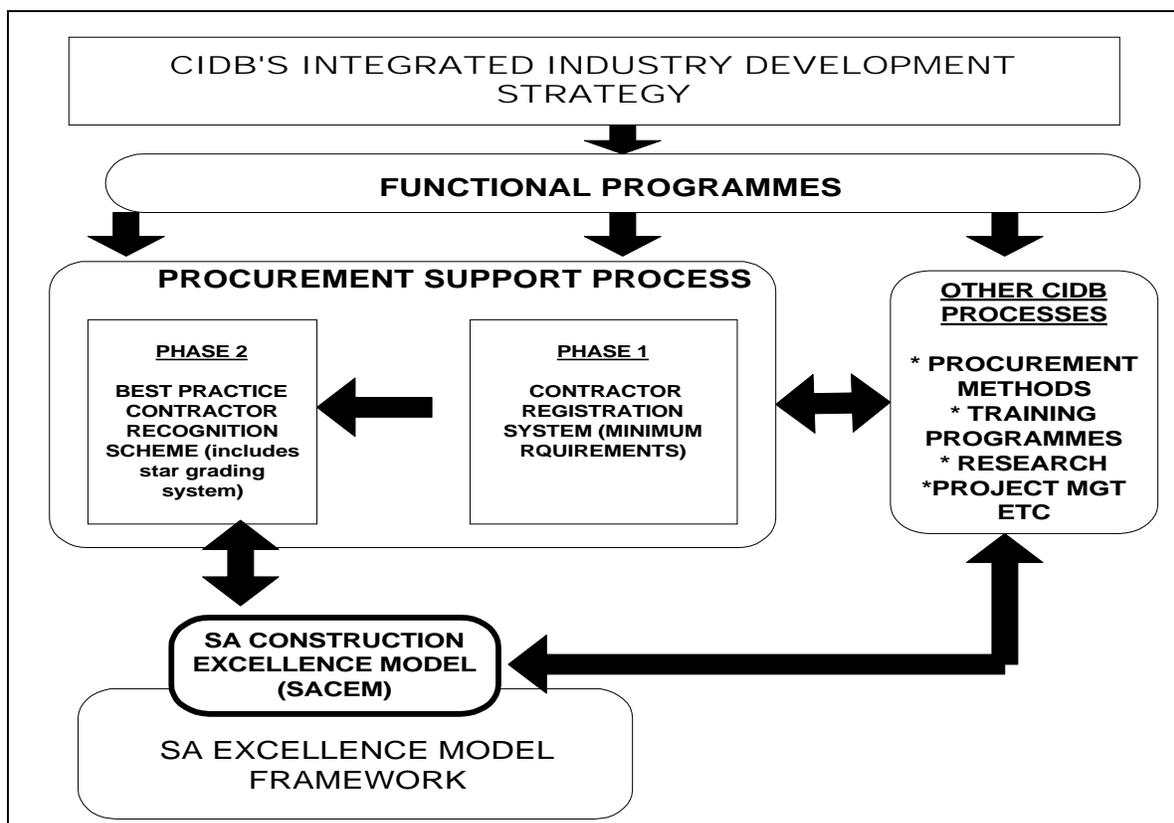


Figure 2: SACEM’s Relationship with the Industry Development strategy

## 5.3 Performance Assessment of Contractors

A second key component of the CID strategy is to directly assist contractors to identify their areas of improvement and thus continuously improve their operations. Performance assessment could be approached in two ways; by

contractors themselves as part of an internal exercise, or by an independent agent where external recognition is required.

Many other applications of SACEM abound. SACEM could be used by financial institutions, such as commercial banks, to assess the level of contractors overall performance and to determine the level of financial risk associated contractors.

## **6. ENVISAGED SACEM BENEFITS**

The following is the summary of the key benefits of the SACEM model:

- Standard, structured tool to assist contractors assess and improve performance through higher productivity, quality and effectiveness.
- SACEM can serve as a useful performance benchmarking tool for contractors.
- Risk management tool for construction clients. Contractors' risk profiles will be easily identifiable and managed appropriately.
- Tendering costs can be reduced for both the clients and contractors if SACEM is used as a pre-qualification system.
- Results from using SACEM can add value for money on projects and therefore satisfaction for clients, taxpayers and end-users.

## **7. CONCLUSION**

The SACEM project is currently undergoing pilot testing to evaluate the model's robustness, appropriateness and usefulness to the contractors. The results of the pilot study will be used to indicate the level of contractor's understanding of total quality management (TQM) principles, acceptance of the model and the willingness and preparedness to use the model.

With the implementation of the CIDB's industry development strategy under way, the authors of this paper are convinced that SACEM will play a significant contribution in realising the goal of improving industry performance.

The South African construction industry is faced with many challenges in the future brought about by drivers in both the domestic and the international environment. Globalisation brings with it many challenges and opportunities. In order to survive, contractors will have to adopt an appropriate culture, systems and tools; and to achieve performance excellence they will need the support of all other construction stakeholders.

## **8. REFERENCES**

Allens, A.R. (1994). "Quality Management in the Construction Phase of the Traditional Procurement System in South Africa: The Case of the Western Cape", University of Cape Town in Cape Town, Western Cape, South Africa.

Beckhard, R., and Harris, R.T. (1987). "Organisational Transitions: Managing Complex Organisational Change". 2<sup>nd</sup> Edition, Addison Wesley.

Brown, M.G. (1996). Baldrige Award Winning Quality. ASQC Quality Press.

Department of Public Works (1999). "Creating an Enabling Environment for Reconstruction, Growth and Development in the Construction Industry". *The White Paper, Government*, Pretoria, South Africa.

- Dlungwana, W.S. (2000). "Literature Review on Business Excellence Model: The Potential for Developing a South African Construction Excellence Model". Council for Industrial and Scientific Research (CSIR) in Pretoria, Gauteng, South Africa.
- Egan, J. (1998). "Rethinking Construction: The Report of the Construction Task Force". Her Majesty's Stationery Ofc., London.
- Henry, A.L. (1994). "The Factors Associated with Insolvency Among Contractors in the South African Construction Industry: a Case Study of the Western Cape Region". University of Cape Town in Cape town, Western Cape, South Africa.
- Griffis, B. (1992). "ADR, TQM, partnering and other management fantasies". *Journal of Professional Issues in Engineering Education and Practice*, ASCE, 118(4) pp. 331-344.
- Latham, M.(1994). "Constructing the Team" Final Report of the Government. Industry Review of Procurement and Contractual Arrangements in the UK Construction Industry. HMSO, London
- Lobelo, L. (1996). "An Investigation into Factors Associated with Insolvencies Amongst Civil Engineering Contracting Firms in South Africa". University of Cape Town in Cape Town, Western Cape, South Africa.
- Low, S.P., and Chan, F.M. (1998). "Quality management systems: a study of authority and empowerment". *Building Research and Information*, 25(3), pp. 158-169.
- Nadler, D.A., and Tushman, M.L. (1998). "Organisational Frame Bending: principles for Management Reorientation". *The Academy of Management Executive*, August, pp. 194-204.
- Peters, T. (1991). *Thriving on Chaos: Handbook for Management Revolution*, 2<sup>nd</sup> Edition, Harper Collins.
- Porter, M.E. (1980). *Competitive Strategy: Techniques for Analysing Industries and Competitiveness*. The Free Press, New York.
- Smallwood, J.J. (2000). "A Study of the Relationship Between Occupational Health and Safety, Labour Productivity and Quality in the South African Construction Industry". *Unpublished PhD*, University of Port Elizabeth in Port Elizabeth, Eastern Cape, South Africa.