



Measuring Strategic Performance in Construction Companies: A Proposed Integrated Model

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Review

Abstract

Purpose- This paper examines and compares performance measurement system and performance frameworks commonly used within the construction industry. The paper explores the strengths and weaknesses of Balanced Scorecard (BSC) and Business Excellence Model (BEM) to propose an integrated model for measuring strategic performance of construction organisations as a single model. The purpose is to help organisations achieve performance excellence, financial integrity and continuous improvement in business results to sustain competitive advantage.

Design/Methodology/Approach- The paper presents a comprehensive review of literature on performance measurement generally and specifically examines the most popular model for measuring performance in the construction industry with emphasis on the BEM design for the South African construction industry. To achieve the main objective, the paper compares and contrasts the BEM and BSC against the five key areas of management control system to determine the strengths and weaknesses of each model. The models are then related and explained in the construction industry setting.

Findings- The study reveals that the most popular performance measurement framework in construction includes: Balanced Scorecard; Key Performance Indicators; and European Foundation for Quality and Management (EFQM). However, literature also reveals that Malcolm Baldrige National Quality Award (MBNQA) is being used to measure performance in the construction. The study findings indicated that BSC and BEM could be combined to provide an integrated model that will encompass every facet of construction performance measures.

Research Implication- The paper integrates the BSC and BEM performance measurement models, to provide construction organisations the opportunities of benefitting from the two models as a single tool without having to use more than one model or miss out any important aspect of performance measures. The model will assist organisations perform regular health checks of all business process and at the same time help align organisational activities with strategic primacy.

Originality/ Values- The conceptual paper presents an integration of processes and perspectives for measuring performance as a new and useful tool in the context of the South African construction industry. The paper suggests that research efforts should be directed on how to implement the strategic performance model efficiently within a specific construction environment.

Practical Implication- The paper offers an integrated construction excellence model as a useful tool for measuring both financial and non-financial performance aspects of construction organisations. This will provide managers, owners and other stakeholders the chance of measuring processes and pre-eminent strategic initiatives using a single model.

Keywords: construction industry, performance model, performance measurement, strategic performance, South Africa.

INTRODUCTION

The growing importance of performance measurement has made performance measurement systems to be recognised by researchers as the required efforts to support continuous improvement methods and measure the effectiveness of organisations' actions (Garengo, Biazzo and Bititci, 2005). Performance measurement is a task undertaken by most organisations with different manners of approach. Different techniques have been employed globally to measure performance, and the concept has drawn more attention from researchers (Niven, 2000). Parker (2000) contends that many organisations measure performances methodically and comprehensively while some adopt an unplanned approach or do it sketchily. However construction organisations have yet to reap benefits, in spite of the level of awareness of performance measurement and high prioritisation of the concept on the program of many construction organisations (Bassioni, 2004).

The construction industry has an age long history of sub-optimal performance in every aspect of performance, from health and safety to strategic management performance (Price, 2003; Ankra, Proverb & Debrah, 2009). Pun, Chin and Lau (1999) the proliferation of performance frameworks that require adequate attention in their selection so that they yield desired outcomes. There is also the difficulty of finding a perfect balance between organisation strategies and the numerous performance measurement frameworks in use (Wongrassmee, Gardiner & Simmons, 2003).

This study therefore, reviews performance measurement frameworks in general use and with emphasis on those applicable to the construction industry. The study investigates whether a perfect balance between organisation strategies and performance measurement framework could be established. To this end, the study covers key performance frameworks in use in construction and presents the elements common to strategic performance measurement frameworks in the next section. Finally, the study proposes an integrated model for strategic performance measurement, which would be significant to construction organisations, managers and other stakeholders as they measure performance within their entities.

REVIEW OF PERFORMANCE MANAGEMENT LITERATURE

Performance measurement and system defined

The measurement of performance is central to decision making and judgement by organisations, but despite a plethora of research on the concept of performance and its measurement, the definition of the term remains inconclusive. Keats and Hitts (1988) opine that the concept is viewed as problematic both in terms of definition and measurement. Bassioni (2004) also argue that the definition of performance, performance measure, performance measurement and performance management processes are rarely given in literature, when dealing with the issue of performance. EFQM (2003) views performance as a measure of an individual, a team, an organisation or a process level for goal attainment achieved. In other words, performance is a measure of how effective and efficient the mechanism/process put in place by an organisation attains its desired results (Wu, 2009). Nelly *et al.* (1995) and Capon (2008) underscore effectiveness and efficiency to be the two

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3 basic components of strategic control and performance. Neely (1998) acknowledges that for
4 an organisation to achieve superior performance relative to its competitors, it must
5 accomplish its targeted objectives and mission, with higher efficiency and effectiveness than
6 its industry rivals. Effectiveness as an element of performance connotes the degree to which
7 stakeholder requirement is achieved, while efficiency, measures how well the organisation
8 utilises its resources and capabilities economically to meet requirements or desired levels of
9 stakeholder satisfaction (Wu, 2009).
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13 Neely (1998) describes Performance Measurement as a process of quantifying the efficiency
14 and effectiveness of past actions through acquisition, collation, sorting, analysis,
15 interpretation and dissemination of appropriate data. Neely *et al.* (2005: 1229) view
16 performance measurement system “as the set of metrics used to quantify both the efficiency
17 and effectiveness of actions”. However this study adopts the definition of performance
18 measurement given by Nani, Dixon and Vollmann (1990) who view performance
19 measurement system “as a means of monitoring and maintaining organisational control,
20 which is the process of ensuring that organisation pursues strategies that lead to the
21 achievement of overall goals and objectives.”
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24 25 **Performance management**

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27 Bititci, Carrie and McDavitt (1997) in their development of a guide for integrating
28 performance measurement systems, distinguish between performance management and
29 measurement. Where they view performance measurement as the process of investigating
30 how effective organisations or individuals actions are in achieving success, and achieving
31 their strategic objectives, similar to Nani, Dixon and Vollmann. On the other hand, Bititci
32 *et al.* (1997) consider performance management as the process through which the organisation
33 manages its action or process of performing strategic task, or function in line with its set
34 corporate and functional strategies and objectives. Performance management process is
35 viewed as a closed loop control system which assists organisations in their deployment of
36 mission, strategic direction, policies and strategies, and receives feedback from various levels
37 (corporate or functional) in order to manage the outcome of the actions of the system.
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42 **Overview of performance measurement models**

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44 The competitive nature of the construction business environment is compelling construction
45 organisations to re-design their strategies in order to survive, and become more competitive.
46 Towards this end, construction organisations re-evaluate their strategies by measuring their
47 performance to monitor the outcomes of their strategies and strategic objectives, thus
48 identifying gaps for performance improvement. Many organisations use traditional
49 accounting measures of performance in making their decisions, but these measures of
50 performance are considered inadequate for strategic decision making. Bourne, Mills, Wilcox,
51 Neely and Platts (2000); Kaplan and Norton (2001) and Gomes, Yasin and Lisboa (2004)
52 summarise the criticisms of these traditional accounting measures to include: backward
53 looking and historical in nature; lack predictive ability to explain future performance trend;
54 and provide information only on root causes. Other shortcomings identified include: inability
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3 to provide linkages between financial numbers and non-financial metrics; inability to offer
4 report on cross-functional processes; lack of consideration for intangible assets; lack of new
5 measures to provide more descriptions with few numbers in broader context, and poor ability
6 to aggregate from an operational level to strategic level.
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9 To overcome these shortcomings, more comprehensive frameworks have been designed to
10 combine both financial and non-financial measures of performance. Many of these
11 frameworks subscribe to the fact that measures of performance should be designed from the
12 organisations' strategy and fashioned in a manner that will fit to specific organisations'
13 characteristic and structure (Nelly, Bourne & Kennerley, 2000). These will provide clear gaps
14 in performance that require measuring by organisations. Nelly *et al.* (2000) provide a
15 summary of characteristics of performance framework design process and these include that:
16 performance measures should originate from the organisations' strategy; and the purpose of
17 each performance measure should be explicit enough. Nelly et al added that collection of data
18 and methods of calculating the level of performance must not be ambiguous. They suggest
19 that all stakeholders have to be involved in the selection of the measures. Further,
20 performance measures that are selected should take organisations' specifics into account, and
21 the process should be flexible to permit revisiting the measures in case of changes in
22 circumstances.
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27 **Performance measurement in the construction industry**

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29 The perspectives of performance measurement have expanded beyond focuses on cost, time
30 and quality to company performance measurement which is usually evaluated using
31 traditional accounting system. Yang *et al.* (2010) posit that performance measurement in the
32 context of construction centres on three different levels namely: project, company and
33 stakeholders' levels. The review provided in this study looks at the corporate performance of
34 organisations within the construction industry. It presents some integrated approaches and
35 multi-faceted corporate performance measurement, developed since the late 1980s that
36 combine both financial and non-financial measures (Ghalayin & Nobble, 1996; Neely, 1999).
37 Wongrassmee *et al.* (2003) categorised the models into groups, to include models that lay
38 emphasis on self-assessment such as the Deming Prize (Japan and Asia), Baldrige Award
39 (USA), and European Foundation for Quality Management Award using Business Excellence
40 Models (Europe). Other models designed to assist leaders/managers measure and improve
41 business performance include Capability Maturity Matrices, Performance Pyramid, Effective
42 Progress and Performance Measurement (EP²M) and the Balance Scorecard (BSC). However,
43 the need for framework and brief explanation of some of the most frequently used
44 frameworks in the construction industry, as argued by Robinson, Anumba, Carrillo and Al-
45 Ghassani (2005), is provided in the following sub-headings.
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52 **The need for performance framework**

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54 Different definitions of framework exist in literature, Deros, Yusof and Salleh (2006) define a
55 framework as a set of theory or knowledge used by individuals as a basis for judgement or
56 decisions. Deros *et al.* (2006) assert that failure or poor implementation of new approaches to
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3 improving quality and performances of organisations necessitate the design of frameworks. In
4 addition, Brown and Devlin (1997) define performance measurement framework as a
5 complete set of performance measures and indicators derived in a manner that is consistent to
6 set of rules and guidelines stated in performance measurement systems. Put succinctly,
7 Aalbrecht, Hejka and McNeley (1991) reiterate the reasons for having frameworks as: (1)
8 illustrating an overview and communicating a new vision to organisations, (2) forcing
9 management to address a substantial list of key issues, which otherwise might not be
10 addressed, (3) giving valuable insights into organisations strengths and weaknesses, and its
11 overall strategic position in the market-place, and (4) supporting implementation and
12 improving the chances of success.
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17 Performance framework is systematic identification of process or procedure that will guide
18 the thinking and implementation of change efforts or where failure requires adequate
19 attention. As a result, Medori and Steple (2000) itemise the required steps to be followed or
20 put into consideration in developing a framework and these include: (1) establishing
21 procedures for selecting and implementing measures, (2) determining whether existing
22 measurement system is up to date and can measure critical issues (i.e. audit capability), (3)
23 selecting measures congruent with company strategy and have a strong relationship with six
24 core competitive priorities (quality, cost, flexibility, time, delivery and future growth), and
25 (4) selecting measures from a data bank and workbook approach (step-by-step methodology).
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29 **Performance measurement frameworks in construction**

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31 The revolution in performance measurement systems in the business environment has made
32 countless frameworks and models available from diverse backgrounds for measuring
33 corporate performance (Neely & Bourne, 2000). The revolution that led to the development
34 of these frameworks was as a result of the inability of conventional metrics to give a
35 complete picture of organisational performance in the ever-changing market that
36 characterises business environments (Stone & Banks, 1997). Many of the archetypes or
37 models evolved for adoption in business come with significant diversity both in design and
38 implementation. The most frequently adopted frameworks in construction identified by
39 Robinson *et al.* (2005), includes Balanced Scorecard, EFQM and the Key Performance
40 Indicators. Lam, Lam and Wang (2008) also used Malcolm Baldrige National Quality Award
41 (MBNQA) to assess the strengths and weakness of contracting organisations in Hong Kong
42 for continuous improvement accomplishment. These frameworks were analysed to assess
43 their strengths, weaknesses or criticisms, typical application and their key success factors (see
44 Table 1).
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49 *The Balanced Scorecard*

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51 The Balanced Scorecard was introduced by Kaplan and Norton (1992) as a strategic planning
52 and management tool to assist organisations align business activities to their vision and
53 strategy, improve internal and external communications, and monitor organisation
54 performance against strategic goals (BSC Institute, 2006). The tool incorporates four distinct
55 but related measurement perspectives, and with a wide range of potential sub-measures
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(Kagioglou, Cooper & Aouad, 2001). The four perspectives in BSC according to Andersen, Lawrie and Shulver (2000); Parker (2000); Kagioglou et al. (, 2001) include: financial perspective, customer perspective, internal business process, and innovation, learning and improvement perspectives.

Amaratunga, Baldry and Sarshar (2001) assert that the BSC provides a balance between economic and operating performance. According to Kagioglou *et al.* (2001), the strength of BSC includes: (1) guarding against sub-optimisation by forcing senior managers to consider all pertinent operational issues, (2) communicating objectives and vision to the organisation, and (3) focusing organisational efforts on a relatively small number of measures with relatively low costs if properly implemented.

The model integrates all the key stakeholders (owner, employees and customers) and strikes a balance between financial and non-financial measures with adequate attention on short and long term strategic objectives as well as lagging and leading indicators (Phusavat, 2007; Chiang & Lin, 2009). However, researchers have criticised BSC to be a top-down approach only and that it does not offer interaction between top executive and the firms employees and thus it is not a useful tool for benchmarking activities and in promoting best practices (Kanji & Moura, 2001; Andersen et al., 2001; Chiang & Lin, 2009). Lamotte and Carter (2000) identify reasons for adopting BSC to include:

- the ability to translate organisational strategy into focused, operational, measurable terms; makes strategic implementation of organisation goals take place;
- direct management attention and effort to key issues and create a basis for more consistent decision making;
- provides management team the means to coalesce around a common strategic agenda, gain focus, align issues and build consensus;
- enable a clear strategic link between business / operational units strategy and 'corporate' to create strategic continuity;
- define a platform to communicate strategic priorities across an organisation; provide a means for teams and individuals to know how they contribute to the success of the strategy, ultimately linking reward and compensation to Performance;
- improve the bottom line by making better resource allocation and investment trade-offs; and
- Learn continuously from the company's performance to assess and redirect strategic goals systematically.

Key Performance Indicators

The widely held view is that the construction industry is complex and fragmented, and these characteristics impair its performance. According to Beatham (2003) the fragmentation of the construction industry creates management problems that render it ineffective and inefficient relative to other industries. Recognising these inadequacies, the UK Government instituted a Construction Task Force to challenge the industry to commit itself to change so that it reaps the benefits of fundamental improvements in design, quality, sustainability and customer

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3 satisfaction (Beatham, 2003). The Construction Best Practice Programme (CBPP) and the
4 Movement for Innovation (M4i) were set up by the Task Force, and their terms of reference
5 were to define the requirements needed to deliver targeted improvements (Beatham, 2003).
6 CBPP and M4i came up with key performance measures tagged Key Performance Indicators
7 for the industry. The indicators include: client satisfaction (product & service), defects,
8 predictability (cost & time), profitability, productivity, safety, construction cost, and
9 construction time. According to Bassioni (2004) the main target of these initiatives was to
10 give a clear indication of overall construction industry performance using the performance
11 measures of projects and organisations. However, the KPIs are regarded as lagging measures
12 that barely provide an opportunity for change and so it is lowly rated in the areas of
13 improvement, innovation and in identifying best practices in construction organisations
14 (Beatham *et al.*, 2004).
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19 *European Foundation for Quality Management Excellence Model*

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21 European Foundation for Quality Management (EFQM) is an organisation established by 14
22 European companies in 1988 to help organisations achieve improved performance. EFQM
23 introduced a business excellence model in 1991, as a model that could be used within
24 organisations to measure and improve on their entire performance. The model is developed
25 on eight basic concepts of excellence: leadership, customer and stakeholders' focus, result
26 orientation, management by process and the fact, people development and involvement,
27 continuous learning, innovation and improvement, partnership development and corporate
28 social responsibility (Wu, 2009). Bassioni *et al.* (2005) developed the construction EFQM
29 excellence model for adaptation in the construction industry and listed its enabling criteria to
30 include: leadership; customers and stakeholder focus; strategic management; information and
31 analysis; people, partnerships, suppliers, physical resources, intellectual capital, and risk
32 work culture; and process management. Business excellence model such as EFQM achieves
33 business excellence as continuous improvement model, through being a useful model capable
34 of performing regular health checks of all business processes. The model identifies best
35 practice and performance gaps by allowing both internal and external benchmarking of firms'
36 business processes, without proffering solutions (Andersen *et al.*, 2001). Therefore, its
37 efficiency and effectiveness as a viable strategic management tool is in doubt.
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44 *Malcolm Baldrige National Quality Award*

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46 Malcolm Baldrige National Quality Award (MBNQA) is well-known and one of the most
47 commonly used performance self-assessment model. The model was developed in the US in
48 1987 to offer a systematic viewpoint for understanding management of performance. The
49 MBNQA forms the basis for many National Quality Awards developed by many countries.
50 National Institute of Standards and Technology (NIST, 1998) asserts that the main essence of
51 MBNQA award is to enhance and foster common understanding of the needs for continuous
52 performance improvement and excellence in competitiveness, providing information on
53 successfully adopted performance strategies and the advantages obtained from the use of
54 those strategies. It focuses on establishing a self-assessment benchmark against which
55 performance improvement can be measured and monitored (Pun *et al.*, 1999). Its criteria for
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measuring performance excellence are modelled to assist organisations apply an integrated approach to management of organisational performance that will lead to delivery of continuous improvement values to customers (Dror, 2008). Considering the characteristics of individual organisations and the nature of their environments, the Baldrige model defines and profiles organisation using the following latent variables (Dror, 2008):

- *Organisational environment* - this includes the supply chain, organisation life stage, market profile and technologies;
- *Organisational relationship* - internal structure, customers and suppliers;
- *Competitive environment* - competition and strategic priorities;
- *Strategic tasks* - long-term program; and *Performance management system* - management performance and learning.

The structure of the model is similar to that of EFQM, it starts with leadership and ends with results. It consists of seven basic criteria: Leadership, Strategic planning, Customers and market focus, Workforce focus, Measurement, Analysis, and Knowledge management, Process management, and Results.

Comparison of MBNQA and EFQM

The objective definition of the MBNQA and EFQM models with respect to quality or excellence is a reflection of Total Quality Management (TQM) philosophies. As a result of this, there are commonalities in the criteria used by the two models, each having at least seven criteria. The EFQM model consists of nine criteria in its basic structure which is categorised into enablers and results, whereas MBNQA seven criteria are group into three; leadership triangle, result triangle; and measurement, analysis, and knowledge management (Dror, 2008). The EFQM places more emphasis on the role of processes and comprise two types of results - the business result and human-oriented result such as people satisfaction, impact on society and customer satisfaction. The focus of MBNQA is on a single type of result but with emphasis on the measurement, analysis and knowledge management (Dror, 2008). EFQM builds on the key principles of MBNQA to introduce field research, basically the business result which is one major flaw of MBNQA, which was later adjusted to incorporate the US National Institute of Standards and Technology.

The South African Construction Excellence Model (SACEM)

The South African Excellence Model (SAEM) is an internationally recognised model for business performance evaluation developed by the South African Excellence Foundation (SAEF). The model was launched in 1997 and became operational in 1998. The South African Construction Excellence Model (SACEM) is an adaption of the SAEM which enables business self-assessment in the construction industry. The model was developed by the Council for Scientific and Industrial Research (CSIR) basically to promote continuous improvement within the construction industry. The need for it becomes apparent when poor performance of construction organisations continues unabated and customers are losing confidence and interest in engaging contractors because of fear of sub-optimal performance (Dlungwana, Nxumalo, Huysteen, Rwelamila & Noyana, 2002). Therefore, SACEM is

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3 viewed as a pertinent and comprehensive tool developed to promote the concept of TQM and
4 culture of best practices in the construction industry at all levels (Dlungwana *et al.*, 2002).
5 SACEM comprise eleven criteria used in evaluating organisation performance. The criteria
6 include: leadership 10%, policy and strategy 7%, customer and market focus 6%, people
7 management 7%, resources and information management 6%, process 12%, impact on
8 society 6%, customer satisfaction 17%, people satisfaction 9%, supplier and partnership
9 performance 3%, and business result 15% (Dlungwana *et al.*, 2002). Basically, the criteria
10 were developed using the EFQM and Malcolm Baldrige National Quality Award criteria as
11 points of departure (South African Excellence Foundation, 2004) (see the equation below).
12 Therefore, the shortcomings of BEM are apparent in the model and as such cannot precipitate
13 best practices in isolation.
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18 Mathematically, $MBNQA + EFQM = SACEM$
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Table 1: Analyses of frameworks for measuring corporate performance in the construction industry

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Dimensions	BSC	MBNQA	EFQM	KPIs
Weaknesses	Top-down approach only that does not offer interaction between top executive and the firms employees. It does not identify the relationship between measures developed for specific goal. It is time consuming and difficult to implement in a large organisation. There is problem of selection of measures. BSC information is not directly useful for benchmarking activities and cross industry performance comparisons	The model is result oriented and not quality focused. The model does not take care of privately owned organisations and large with diversified line of business will have its division considered separately. There is difficulty in keeping eyes on the journey to the award due to turnover of workforce and lack of commitment of employees. Lack of evidence of the link between financial performance and the Baldrige award. The award criteria is static and do not keep pace with change of events	It requires rigorous application of the Self-Assessment process for it to be effective; Its vague and underrated in the areas of improvement, innovation and supplier partnership strategy; Complex underlying criteria scoring system required to enable benchmarking become difficult without it been carried out by a trained and experienced personnel; and It requires the use of external assessors	Subjective assessment Crude/questionable measures; Large number of schemes-fragmentation; Lagging measures that barely provide opportunity for change; Being; employed within the construction industry as a marketing tools rather than being part of the construction business management Lack a holistic viewpoint on the relationship among different indicators
Strengths	Focus management program on attaining strategic goals. Prioritisation of activities and investment behind strategic objectives. Enhance continuous learning about strategic (causes and effects) relationships affecting an organisation. Aligns goals and rewards behind common strategy across organisation.	The Model offers feedback as an outcome of the evaluation method; It encourages sharing of information on successful strategies for performance excellence and the accrued advantages in adopting the strategies	evaluate organisational processes quality; identify areas of weaknesses or low performance against industry rival; Capable of helping organisations achieve excellence through continuous improvement in the deployment and management process to prompt expansive use of best practice	Track long-term trends in performance, and specifically, to demonstrate whether the construction industry was achieving the industry improvement targets; Provide companies with a simple method of establishing a performance measurement system in an organisation

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Evaluation	Four perspectives: financial; customer; internal process; and innovation, learning and growth.	It consists of seven basic criteria: Leadership; Strategic planning; Customers and market focus; Workforce focus; Measurement, Analysis, and Knowledge management; process management; and Results. 1000 points allocated over 20 sub-criteria	It consists of nine criteria: leadership; people; policy and strategy; partnership and resources; processes; customer; people development; performance and corporate social responsibility. 1000 points allocated to the criteria	Drivers for Change (5 sub-criteria); Improving the Project Process (4 sub-criteria); Targets for Improvement (7 sub-criteria)
Key success factors	Total commitment and sponsorship by entire management team and on-going process embedded in governance processes	Management team level sponsorship and commitment, On-going process embedded in day to day management	Total commitment and sponsorship by management team. Embed the on-going process in management governance process to drive improvement	Total commitment and sponsorship by management team
Purpose	Designed to communicate and evaluate strategic performance, test the validity of strategy and monitor organisation's performance against its delivery on a regular basis, ensure organisation strategies are implemented to assist in continuously learn from its performance and adapt its strategy accordingly	Promote quality awareness, performance excellence and competitiveness improvement, share information on successful performance strategies and the benefits derived	Perform regular "Health checks" of all business process to identify strengths and weaknesses, develop a "checklist" to indicate good practices used for business planning and assessment, promote continuous improvement and enable benchmarking of organisation processes	Financial and operational objectives adopted in assessing company's performance; Improve organisation management decision making; To identify if improvement in performance is being achieved; To drive continuous improvement process in an organisation
Mechanistic	provides a clear strategic link between corporate strategy and operational units to enable strategic continuity	Self-assessment, performance measurement and audit, qualification for site visit and competition	Self-assessment, considers past and present performance and audit, qualification for site visit and competition	

Sources: Pun *et al* (1999), Lamotte and Carter (2000) Andersen *et al.* (2000), Kagioglou *et al.* (2001), Dror (2008) and Yang *et al.* (2010)

DEVELOPING A PERFORMANCE MEASUREMENT SYSTEM (PMS)

A review of literature provides information on several frameworks developed for measuring performance of organisations. Those provided in this paper are related frameworks which underlie the performance measurement system (PMS) proposed in this study. A more comprehensive list of performance measures include: performance measurement questionnaire (PMQ) (Dixon, Nanni & Vollmann, 1990); strategic measurement analysis and reporting technique (SMART) (Lynch & Cross, 1991); the results and determinants matrix (R&DM) (Fitzgerald, Johnson, Brignall, Silvestro & Vos, 1991); the balanced scorecard (BSC) (Kaplan & Norton, 1996); consistent performance measurement systems (CPMS) (Flapper, Fortuin & Stoop, 1996); integrated performance measurement systems (IPMS) (Bititci, Carrie & McDevitt, 1997), comparative business scorecard (CBS) (Kanji, 1998); integrated PM framework (IPMF) (Medori, 1998), the Cambridge performance measurement process (CPMP) (Bourne, Mills, Wilcox, Nelly & Platts, 2000); dynamic performance measurement systems (DPMS) (Bititci, Turner & Begemann, 2000) and The South African Construction Excellence Model (SACEM) (Dlungwana *et al.*, 2002). Despite these large number of measures, researchers demand more effective frameworks that will ensure that organisations' measures of performance emanate from their strategic decisions (Price, 2003). Price (2003) accordingly, recommends that measurement tools such as BSC and the BEM are better positioned to achieve the linkages between performance and strategy and should be modelled. Therefore, to attain and sustain continuous improvement in performance and bring about the required change in business sphere such an integrated framework is a necessity. This will allow PMS to be integrated into the strategy process of organisations. From the foregone review, it is evident that different models from different field of studies, measure different aspect of performance from different perspective. Thus, it is relevant to ask, why has there not been a merging of all these archetypes into a comprehensive and exemplary one rather than the proliferation of models, frameworks and typologies?

This current study does not aspire to reinvent the wheel, but rather proposes a new model, developed by examining the successes and accomplishment of earlier models and build upon these existing philosophies. Many of the existing models have proven to be precise and rational but most do not take into cognisance every perspective of performance criteria to managing organisational performance (Bassioni, 2004). To develop the new model, the SACEM which is a business excellence model that originates from the combination of EFQM and MBNQA and shares the same characteristics peculiar to two models is considered as BEM. This is because the model is designed specifically to take care of performance issues and promote culture of performance excellence in the South African construction industry environment (Dlungwana *et al.*, 2002). It is essential to consider the industry and country specifics in the design of models; failure to do this is a recipe for operational failure of such model. Rwelamila, Talukhaba and Ngowi (2000) argue that the failure of the construction industry in many developing countries, especially in Africa, is traceable to their dogmatic acceptance of various approaches that tend towards development without considering local factors.

Integrating business excellence model and the balanced scorecard

From the review, this paper proposes the integration of BSC and BEM as a viable model which could be used by organisations to establish clear strategic vision of their strategic process and concentrate attention on improving their long-term strategic performance. The two models selected, share a common idea about management; however, each model using different approaches to address issues of measurement and management of organisation's performance (Lamotte & Carter, 2000). Combining the two models will be complementary to each other and provide a better means of assessing performance within organisations. This argument is entrenched by Lamotte and Carter (2000), and by Andersen *et al.* (2000:10) who quoted Paul Gemoets that "EFQM needs Scorecards to: align with the vision, mission and strategy; keep good promises "alive and kicking"; [and] for continuous [management] attention and communication." Within the construction industry, Price (2003) asserts that existing measures of performance within construction organisations that are based on accounting systems are lagging indicators that measure only short-term performance and fail to monitor strategic performance. Price suggests a tool that measures strategic performance more efficiently and effectively. Price (2003) had suggested an integration of BSC and BEM into strategic management processes to enhance continuous improvement. Wongrassamee *et al.* (2003) argue that both academic and industry practitioners agree that both BSC and BEM measurement tools are useful for enhancing business performance and continuous improvement, but are sceptical of how managers can identify the key performance indicators from their corporate strategy.

Andersen *et al.* (2000) reported that BEM can be used at two different levels: at the passive level to act as checklist for configuring the strategic vision, values and strategy of organisations; and at the active level BEM provides a health check of organisations performance and identifies areas for improvement. BSC on the other hand is a performance measurement tool that encourages two-way communication of strategic vision and strategic results between top management and employees. It is one of the most researched and highly utilised performance models that provide balanced performance measure from the organisational strategic mission, to management and operational levels and to individual performance. Table 2 provides a summary of the comparison of BEM and BSC based on five key areas of management control system. The development of the PM model involves the combination of BEM and BSC to identify their key performance indicators. Garengo *et al.* (2005) identified nine generic criteria that an effective PMS model should satisfy. These include Depth and Breadth; Clarity and Simplicity; Strategy Alignment; Strategy Development; Focus on Stakeholders; Balance: Dynamic Adaptability; Process Orientation; and Causal Relationships. The set of criteria from SACEM are then related to different perspectives of the BSC and evaluated against the nine generic criteria that models must satisfy in line with (Garengo *et al.*, 2005) as shown Table 2

Table 2: A summary of the BSC and BEM performance models against the nine dimensions of PMS Model

PMS models	Balanced Scorecard	Business Excellence Model
1. Depth and	Yes	No

Breadth	Yes	Yes
2. Clarity and simplicity	No	Yes
3. Strategy and alignment	Yes	No
4. Strategy and improvement	Yes	No
5. Focus on stakeholders	No	Yes
6. Balance		
Internal & external	Yes	Yes
Financial & Non-financial	Yes	Yes
8. Process and oriented	Partial	Partial
9. Causal and relationship	Yes	Partial

Source: Garengo *et al.* (2005) and Bergin-Seer (2007)

Table 3: Comparison of BEM and BSC Models

Key areas of Management	Excellence Model	Balanced Scorecard
1. Objectives	It is based on TQM philosophies and has multiple objectives which include: Leadership; people management; strategy and planning; resources management; process management; people satisfaction, customer satisfaction; impact on society; and business results.	This is consist of many objectives based on organisation strategy and lay emphasis on four generic perspectives: Financial, Customer; Internal business processes; and innovation, learning and growth
2. strategies and plans	It does not address strategic issues, but use weighted criteria and sub-criteria as guidance	Assign strategic measures. Develop strategy map of actions to align each measures to organisational strategy
3. Targets	It is not specific. Management set the expected levels of performance	It does not set target. It is a non-prescriptive model, thus managements are required to set target for expected performance level
4. Rewards	Needs an adequate reward and excellence performance recognition mechanism, but offer little explanation about it	Suggest that individual reward should be related to strategic measure of performance
5. Feedback	This is not addressed. Nevertheless, the framework itself provides feedback information as a default not by design of the evaluation model	It requires double-loop learning which is more complicated than single-loop feedback.

Source: Wongrassmee *et al.* (2003)

The proposed integrated construction excellence model

The proposed integrated construction excellence model adopts the principle of TQM upon which BEM was built and the preferred corporate strategy on which the objective perspectives of BSC is premised. The model is depicted in Figure 1 and extends performance criteria from seven to eleven (see Figure 1 and the discussion below) to take care of some missing measures of performance (SAEF, 2000). The model starts with leadership and terminates with business results so as to benefit from wider usage and have integrity. The criteria are mapped into the four perspectives of the BSC; because the model is targeted at aligning organisation strategic objectives to every facet of PMS and integrates same to the strategy process. BSC evaluates performance of selected operational activities adjudged to be central in contributing to fulfilment of organisation strategic objective or adopted to identify the strategic drivers for performance excellence; while BEM evaluates performance against a set yardstick of activities, and against the generic best practice (Andersen *et al.*, 2000). The BEM will pinpoint the areas of weakness of the organisation which may be an impediment to achieving its vision (Lamotte & Carter, 2000). The criteria are mapped to allow for self-assessment of an organisation's performance and embedded in the continuous day to day management process so as to accomplish the organisation's strategic goals. This enables organisations to benchmark their internal process, business results and compare results with similar organisations using similar principles or models of self-assessment.

As indicated earlier, the model has four elements based on objective perspectives of BSC, the customer, innovation; learning and growth; internal; and financial perspectives. The customer perspective consists of client satisfaction; social responsibility; and client and market focus. This explains how the organisation expects customers to view the organisation when its visions and missions are accomplished. This perspective also encompasses how organisations develop good relationships with their customers; assess their requirements; and measure their satisfaction in terms of services or product delivery. Innovation, learning and growth perspective involves people management; leadership; strategy and planning; and people satisfaction. To achieve the mission and vision of the organisation, what and how must the organisation learn, innovate and improve? Strategies are conceived or formulated by the leaders or top management team who are the main drivers of the organisation. They create the atmosphere for the organisation to thrive and also develop concept that move the persistent search for continuous improvement and enhancement of customer's value. This perspective focuses key issues related to practices that can lead to the development of higher performance of the workforce as a growing organisation. This perspective offers opportunity to employees to continually increase their knowledge, improve on their performance and imbibe the culture of best practices and always strive to give their possible best to the organisation.

The internal perspective entail resources and information management; suppliers and partnership performance; and processes. In order to satisfy customers, the model maps the strategy consisting of well-defined methods of satisfying customer's requirement and enhances improvement in organisational performance in achieving excellence. This involves gathering of information to offer improved business excellence in providing value for money, meeting the need of the internal stakeholders', strengthening of customer's relationship and

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3 partnership. The last element is the financial perspective. The financial perspective reveals
4 the performance of an organisation in achieving financial probity and integrity and
5 establishes leadership concerns for effective and efficient deployment of organisation's
6 resources. This ensures that organisational financial performance indicators are monitored to
7 enhance performance excellence and competitiveness improvement. This is result-oriented
8 and is a measure of performance as wide range key performance indicator encompassing both
9 financial and non-financial metrics.
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13 The model is principally presented as a strategic performance and self-assessment tool for
14 health checks by organisations to achieve their strategic goals, and business excellence. BEM
15 is a diagnostic tool capable of identifying areas for improvement but cannot prioritise areas
16 where improvement could be made to create performance excellence and business results
17 (Lamotte & Carter, 2000). This is where BSC complements the model by providing the
18 strategic focus needed by organisations to prioritise their strategic action and effectively
19 deploy resources (Lamotte & Carter, 2000).
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23 The model is essentially based on adaptation of generic BEM and BSC models that have been
24 established to be rigorous and workable even within the construction industry. The model not
25 sdesigned for awards like its founding models. The scores are allocated for ease of evaluation
26 of the perspectives and this should provide objective self-assessment that can help
27 organisations identify gaps in their performance, strengths and weaknesses, prioritise and
28 offer assistance in exploring the opportunities to enhance improvement. The model can be
29 used to obtain and share information to establish a self-assessment benchmark and enhance
30 organisational learning concept which is important for future organisation development
31 (Leonard & McAdam, 2002). The eleven criteria and points allocated to each as given by
32 SAFRI (2004) are as follow: Leadership (100 points); Strategy and planning (70 points);
33 Client and market focus (60 points); People management (90 points); Resources and
34 information management (60 points); Process management (120 points); Suppliers and
35 partnership (30 points); Client satisfaction (170 points); People satisfaction (90 points);
36 Social responsibility (60 points); and Business results (150 points).
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41 **Model application**

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43 The implementation of the model in Figure 1 requires total commitment from entire
44 management and employees of any organisation willing to adopt the model. Various
45 components and practices must be put in place, management of organisations need to have a
46 clear strategic roadmap and better understanding of the underlying principle on which the
47 self-assessment tool is built (Pun et al., 1999). The developed model requires reflections and
48 considerations before it is implemented. Inappropriate self-assessment can make
49 organisations invest in non-strategic priority areas. It is possible that areas of weakness
50 identified by the self-assessment tool are not of strategic importance to the organisation,
51 hence there may be no reason for committing resources to improving those areas. However,
52 there may be justification for allocating resources to those areas of weakness if the
53 performance is below standard (Lamotte & Carter, 2000). At the same time, areas where the
54 organisation seems to be performing well may also be non-strategic areas, thus it is those
55 areas where an organisation is weak but support strategic priority that require the most
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3 attention (Lamotte & Carter, 2000). Therefore, BSC can be employed to provide strategic
4 direction required to prioritise and deploy resources effectively.
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6 The proposed model will methodically evaluate the general performance of construction
7 using the identified criteria aligned to the four linked perspectives of the BSC. Although,
8 there is no universally superior method of conducting self-assessment, it is dependent on the
9 organisation strategic stance, culture and the willingness for continuous improvement. The
10 development of positive and supportive organisational change culture has been underscored
11 when organisations desire or adopt performance excellence and improvement tool (Beckhard
12 & Harris, 1987; Griffis, 1992; Low & Chan, 1998).
13

14 The key issue envisaged by this study is to direct the attention of organisations to how its
15 strengths and weaknesses can be identified to enhance continuous improvement. There is
16 little consideration for winning performance awards. Therefore, the paper adopts the
17 questionnaire approach as the simplest and cheapest way for conducting self-assessment in
18 line with EFQM recommendations. According to Dlungwana *et al.* (2002) several but
19 relevant questions regarding the general performance of a construction organisation business
20 are posed under each criterion. Respondents' are then required to score them on a 0 to 3
21 scale, where 0 denotes that the objective or operational activity is yet to be accomplished or
22 has 'not started', and 3 represent a situation where 'performance objective is fully achieved'.
23 The scores are summed up to a total possible score of 1000. In the award models such as
24 MBNQA, EFQM and SAEM, organisations need to score between 650 and 700 points;
25 between 700 and 750; and minimum of 500 points to be able to qualify for awards
26 respectively.
27

28 To reiterate, the current model is not developed for the purpose of an award, but using
29 aggregated average of 650 of the award models will be a good basis. This indicates that
30 construction organisations need to score 188.5 points out of 290 points for customer
31 perspectives; 227.5 points out of 350 points for innovation, learning and growth; 136.5 points
32 out of 210 points on internal perspectives; and 97.5 points out of 150 points for business
33 results. Organisations with aggregate scores that is close to, and above these points, can be
34 considered to be performing more than their competitors.
35

36 The self-assessment model follows SAEF (2000) involving seven application steps:
37 organisational commitment; planning; collection of information on the organisation current
38 position; identification of strength, gaps in performance and areas for improvement;
39 identification of priority areas for performance excellence improvement; establishment,
40 recommendation, plan and implementation of further action; and review and revisit the
41 process. The stages described briefly in the next paragraphs, provide a better understanding
42 and feedback that allows both internal and external benchmarking based on the model
43 criteria.
44

45 *Commitment-* Total commitment and full sponsorship of organisational management is
46 essential for a successful implementation of the self-assessment model. The leadership of
47 organisations must be ready along with employees to implement changes and avoid
48 resistance.
49

50 *Planning-* The self-assessment model requires planning to be successful. The initial step is
51 training of participants that will use the tool, and also provide a clear delegation of
52 responsibility and line of authority. The time to start the evaluation must be stated as well as
53 an estimated likely time for completion. The essence of the assessment should be made clear
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3 that it is to encourage business excellence but not to measure the performance of individuals.
4 This should reduce resistance from employees.
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6 *Collection of information-* This begins with self-organisation health checks by management
7 of the organisation in aligning their strategic initiatives to the desired level of performance.
8 BSC allows top-down approach in carrying out evaluation while BEM can be adopted at
9 operational or functional level to obtain information from the employees or functional or
10 operational management on how successful the organisation performance strategies are, and
11 how the organisation has benefited from the process in achieving improved performance.
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14 *Identification of strength, gaps in performance and areas for improvement-* the model helps
15 in characterising individual organisation and its environment, thus assist the organisation in
16 identifying the main strength of the organisation and weaknesses. This will help in
17 identifying the gaps or areas that requires improvement. An organisation needs to identify
18 external opportunities that can help in neutralising threats.
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21 *Identification of priority areas for performance excellence improvement-* After identifying
22 the areas for improvement, managements of an organisation is required to align their
23 operational activities to strategic priorities with respect to their mission and vision. This
24 involves the use of strengths to match the weaknesses using the enabling driving forces to
25 obtain desired results. The process should be reviewed and permit two way communication
26 between management and employees.
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29 *Implementation-* Successful prioritisation of strategic areas for improvement will assist an
30 organisation to establish, recommend, plan and implement plans for further action. It will
31 enable management to set targets or standards against which performance improvement
32 agenda will be verified. This will require delegation of authority to individuals, set targets for
33 them and time for delivering on their assigned tasks.
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36 *Review and revisit the process-* The model involves repeating the process at regular intervals.
37 This maybe on a short-term or long-term basis as part of business strategic routines and plans,
38 and for continuous performance improvement.
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41 42 **CONCLUSION**

43
44 This paper comprehensively reviews extant literature on performance measurement and
45 performance frameworks with emphasis on models commonly employed within the
46 construction industry. The paper identifies and examines major performance measurement
47 models used in construction; EFQM excellence model; MBNQA, BSC, KPI and the SACEM
48 developed for the South African construction industry environment. These major frameworks
49 have proven to be effective and efficient in assisting organisations achieve performance
50 excellence and improvement in competitiveness, whilst also beset with certain limitations.
51 Consequent upon this, the paper examines the strengths, weaknesses, purpose and key
52 success factors of the frameworks and conclude that there are improvement opportunities
53 within the frameworks so that they enhance business excellence.
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3 As a result of multiplicity of models in general and in construction, several organisations
4 have become confused but earnestly desire means of achieving business excellence and
5 sustained competitive advantage. Different operational environments and different challenges
6 means that performance measurement frameworks must align closely with their strategic
7 objectives.. Researchers agree that BSC and BEM excellence are very useful tools for
8 continuous improvement and business excellence. Therefore, this paper integrates BEM
9 (SACEM) and the BSC into a single model to serve as a self-assessment and strategic
10 performance measurement tool. The fundamental objective of the proposed model is to assist
11 organisations in achieving performance excellence, improved business results and gain
12 healthy financial outcomes. The two models have their inherent strengths and weaknesses
13 depending on their application and as such, the integration brought both models together to
14 complement each other. The BSC is a dynamic tool and deeply rooted in cause and effect
15 association with an obvious attention on strategies used by organisations. This complements
16 the static design upon which BEM is based as a diagnostic tool that supports cause and effect
17 logic to connect enablers and results. Hence, combining the two models for measuring
18 organisational performance has the potential to assist organisations achieve performance
19 excellence while concurrently escalating their dexterity and sustained competitive advantage.
20 The integration of operational activities and their evaluation in measuring business results
21 would still require to be conducted by individual organisations based on their vision, strategic
22 objectives and needs.
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29 The developed model follows generic BSC and BEM frameworks and has the potential to be
30 adapted to match different contexts in terms of business and industry. It takes into cognisance
31 diversity in the structure of organisations, decision-making style including the economic
32 climate within the industry and practices of the stakeholders' along the supply chain.
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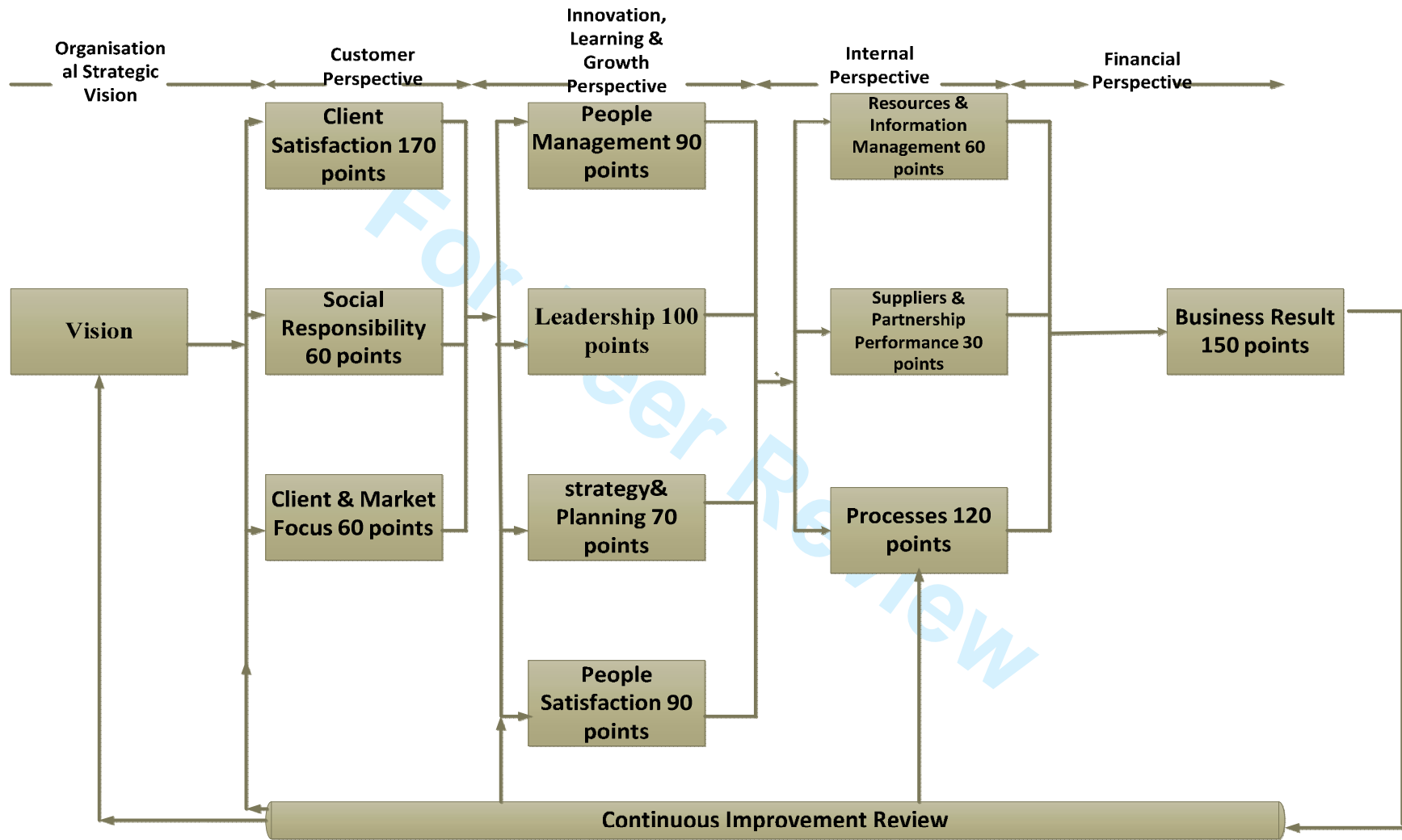


Figure 1: proposed integrated construction excellence model

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For Peer Review