A Quality Infrastructure Framework for the Performance of Small and Medium - Sized Enterprises in South Africa

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Abstract

One of the reasons for the establishment of a quality infrastructure (QI) is to make a contribution towards sustainable development by supporting the three facets of economic, social development and environmental protection. Small and Medium Enterprises (SMEs), driven largely by their potential to contribute towards the economy, have been identified as one of the critical component for economic development. From literature point of view there is no doubt that the contribution made by SMEs is widely acknowledged. Despite this positive contribution SMEs are still faced with challenges which inhibit their performance. Whilst the implementation of a quality management systems has been identified in literature as a viable solutions to overcome challenges faced by SMEs, there is lack of research that investigates organisational performance, specifically SMEs performance, in the context of a QI taking into account all its integrated components (namely: standardization, metrology, accreditation and conformity assessment). Previous reports mainly focused on organisational performance either in the context of total quality management philosophy or by only examining ISO 9001 standard as a single factor without integrating other components. A number of researchers have subsequently pointed out the need to advocate to SMEs the positive impact a QI can provide on their business. Other reports specifically confirmed a lack of research that measure performance of a QI covering all its constituents. This study therefore seek to close this research gap by examining the effect of QI on SMEs performance. During this study data collection will occur in two phases with the initial collection phase happening during focus groups and during in-depth interviews followed by a survey. From this study it is expected that the independent variable (QI), as shown in figure 2.1, will have a direct positive influence on the dependent variable (SMEs performance). Furthermore this study will argue that lack of awareness on a QI by SMEs managers/owners may lead to a negative relationship between QI constituencies (standardization, metrology, accreditation and conformity assessment) and SMEs performance.

Key words: quality infrastructure, conformity assessment, standardization, metrology, accreditation, small and medium enterprises, firm performance, product quality, operational quality, business performance.
1. Introduction

During 2010 the South African government appointed a National Commission to draft the country’s vision and national development plan (National Planning Commission, 2011). The commission subsequently pointed out the nine primary challenges South Africa is facing, namely: unemployment, inequality within the educational system, infrastructure, special divisions, economic growth, public health system, public service, corruption and a divided society.

However, six years later during 2016 the country experienced an increase in the rate of unemployment whilst the economy remains negatively affected. The latest statistics (STATSSA 2016) confirmed an unemployment rate of 26.7% with about 5.7 million people in South Africa unemployed. The International Monetary Fund (2016:6) on the other hand confirmed a Growth Domestic Product (GDP) to be 0.7% and projected to increase to 1.8% during the following years. The above reports clearly suggest that serious interventions are required to overcome unemployment and economic challenges in the country. The national development plan (NDP) has since proposed the following objectives specifically to overcome unemployment and economic challenges: (1) Reduction of unemployment rate to 14% by 2020 and (2) an increase of GDP by 2.7% times in real terms, with an annual GDP growth of 5.4% over the period.

One way to achieve the above objectives is through the establishment and support of small and medium enterprise (SMEs) that are competitive and sustainable. Special emphasis is placed on SMEs because of the potential they possess to drive both the economy and provide opportunities for employment. Whiles the report from Ngek and Smit (2013:3043) supports the argument that South Africa has the highest unemployment rates and the biggest disparities in incomes in the world, the same report suggests that one of the most important characteristics of flourishing and growing the economy is through a booming SMEs sector, an argument which is also being supported by Dgentr (2012:5) and Larimo (2013:79). The above reports clearly propounds that SMEs are playing a significant role towards economic growth and job creation worldwide for both developed and developing countries. Despite this positive contribution, SMEs are still faced with numerous challenges which inhibit their competitiveness and sustainability (Lose, Thobekani and Tengeh, 2015; Ramukumba, 2014; Cant and Wiid, 2013). As a results effective interventions are required in order to overcome challenges faced by SMEs.

After the researcher sought literature and engaged in precedent work relating to the scope of the influence of quality infrastructure (QI) on SMEs performance, the researcher identified a gap due to lack of reports that seek to investigate the effect of a QI on SMEs performance. As most of the reports focused on organisational performance mainly in the context of total quality management philosophy or ISO 9001 with the exclusion of other components of QI, this study propose to develop a framework that can be used and implemented as a viable solution to enhance SMEs performance.
It is expected that the proposed framework will explain the effect of QI variables on SMEs performance.

The key research questions that the study seeks to address are the following: What appropriate quality infrastructure framework can be used by SMEs to effectively measure their business performance? How can SMEs implement a quality infrastructure effectively?

The main contributions of this study will be two fold, one from theoretical and the other from a practical point of view. Theoretically it is expected that the study will contribute to new knowledge as well as building to the existing body of knowledge. From a practical point of view the study will contribute by developing an appropriate framework that can be used and implemented by SMEs managers/owners to improve their business performance.

In South Africa a QI is well positioned within the Department of Trade and Industry as part of the Council of Trade and Industry Institutions (COTTI) grouped into three clusters, namely the financial and small business development agencies, regulatory agencies and the technical infrastructure, as shown in figure 1.1

**Figure 1.1: Council of trade and industry institutions (COTTI)**

<table>
<thead>
<tr>
<th>COTTI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial and small Business Development agencies</td>
</tr>
<tr>
<td>Regulatory agencies</td>
</tr>
<tr>
<td>Technical Infrastructure</td>
</tr>
<tr>
<td>Standardization (SABS)</td>
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<tr>
<td>Metrology (NMISA)</td>
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<tr>
<td>Accreditation (SANAS)</td>
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<tr>
<td>National Regulator (NRCS)</td>
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</table>

**Source:** compiled by the researcher

2. **Literature Review**

2.1. *The definition of Small and Medium Enterprises*

Small and medium enterprises will be defined in accordance to the National Small Business Act, act No. 26 of 2003, as follows:

“A separate and distinct business entity, including co-operative enterprises and nongovernmental organisations, managed by one owner or more which, including its branches or subsidiaries, if any, is predominantly carried on in any sector or sub sector of the economy mentioned in Column I of the Schedule”.
The schedule under this act is listing the following sectors or sub-sectors in accordance to the standard industrial classification: Agriculture, mining and quarrying, manufacturing, electricity, gas and water, construction, retail, motor trade and repair services, wholesale trade, commercial agents and allied services, catering, accommodation, transport, storage and communications, finance and business services, community, social and personal services. These sectors are further classified in terms of size of class (micro, very small, small or medium), total number of full time paid employees, turn-over and total gross asset value (excluding fixed property).

For the purpose of this study SMEs will include all sectors or sub-sectors and will be defined in accordance to this act. However, the most common mode of definition that will be used will be based on the total number of paid employees as described by the act under the schedule.

2.2. The definition of Firm Performance
It is important during this study to understand exactly what is meant by “firm performance” in order to have a clear understanding of the dependent variable, namely “SME performance”. Santos (2012:96) cautioned that although firm performance is a relevant construct in strategic management research and frequently used as a dependent variable, there is hardly a consensus about its definition.

The definition of firm performance that will be adopted during this study will be guided by the study from Kafetzopoulos, Psomas and Gotzamani (2015) as well as Sidik (2012). The study from Kafetzopoulos et al. (2015) investigated the impact of ISO 9001effectiveness on three dimensions of a firm’s performance, namely product quality, operational performance and business performance. Sidik (2012) on the other hand suggested five second order constructs serving mediating roles between entrepreneur traits and firm performance.

2.3. The definition of a Quality Infrastructure
The report by Kellermann and Keller (2015) offered the definition of QI by firstly emphasising the need for suppliers to provide product and services that can demonstrate that they meet requirements, specifications or standards. Such demonstration, according to Kellermann and Keller (2015), may consist of inspection, testing, certification, calibration or combination. For the demonstration process to be credible the institutions providing such evidence need to be technically competent and acceptable to the market and regulatory authorities. The definition of a QI is therefore seen as the totality of the policy, legal, regulatory and administrative frameworks and the institutional arrangements required to establish and implement standardisation, metrology, accreditation and conformity assessment services (inspection, testing and product- and system certification) necessary to provide acceptable evidence that products and services meet defined requirements. This definition is in line with QI definition as provided by other reports such as (Tippmann and Bank, 2013; Mid-Term Review for the Quality Infrastructure and Standards Programme (QUISP) in Uganda, 2012; Gonçalves and Peuckert, 2011).

2.4. Conceptual framework and Hypothesis
According to Creswell (2013:83) one component of reviewing the literature is to determine the relevant theories that may be used to explore the questions in a scholarly study. The formulation of a theoretical perspective for studying the relationship between a QI and SMEs performance during this study will indeed provide a useful prototype. During preliminary literature review a number of theories with antecedents related to firm
performance were identified. For example Sidik (2012) mentioned the following five second-order constructs serving mediating roles between entrepreneur traits and firm performance: innovation performance, innovation capacity, organisational search, market orientation and entrepreneur orientation. Other reports focused on the relationship between ISO 9001, total quality management, entrepreneurial capacity, learning orientation, customer learning focus, service creativity concern, service diversity concentration, service response orientation, customer relationship awareness and form performance (Chuwiruch, Jhundra-Indra and Boonlua, 2015; Sidik, 2012; Lakhal, 2014).

A study by Talib, Ali and Idris (2013) proposes the following eight critical success factors (CSF) and the model constructs for SMEs in Malaysian food industry with accreditation as the moderating factor: Leadership, corporate planning, human resource management, customer focus, supplier focus, information management, process management and quality assurance. Kafetzopoulos, Psomas and Gotzamani (2015) identified the following three dimensions of a firm’s performance, namely product quality, operational performance and business performance. This study will focus on the seven constructus as listed in table 3.1.

3. Research Methodology

3.1. Research design
This study will be following an exploratory approach during its first phase, questions will be asked about the relationship between a QI and SMEs performance in order to gain a deeper understanding of the phenomenon between these constructs. To achieve a better understanding of this phenomenon the following will be considered during this process: (1) perform a literature review on critical success factors that affect SME performance (2) interviews experts operating within the QI and SMEs fraternity and (3) perform focus group interviews that will involve SMEs managers/owners. This approach is in line with Saunders et al. (2009:140), who mentioned the three principal ways of conducting an exploratory research, namely: a search of the literature, interviewing experts in the subject and conducting focus group interviews.

Data collected from these interviews and focus groups will then be used during the second phase of the study to design a survey instrument that will be used to collect the second set of data through a quantitative (positivist) approach. It is expected that the data collected during the second phase will be used to finally develop a framework that can be used and implemented by SMEs managers/owners and other interested stakeholders to explain the role of a QI on SMEs performance.

In view of the above mentioned triangulation strategy, it can be argued that the study will be following a mixed research approach whereby phenomenological (qualitative) and positivist (quantitative) research methods will be followed.

3.2. Target Population
The targeted population for this study will be formal SMEs sampled from a list published by Research note on Small, Medium and Micro Enterprise sector of South Africa (2016) which was commissioned by the Small Enterprise Development Agency (SEDA). According to this report the number of formal SMEs recorded during 2015 was 667 433. SANAS website will also be used to compliment the targeted population of the study in addition to the list above. SANAS database list all the accredited facilities from different programs including testing, certification, calibration and inspection which will be suitable and appropriate for this study.
3.3. Sample and Sampling strategy
For the purpose of this study a probability sampling method, specifically a simple random sampling method will be used. The sampling strategy was selected using a flow chart for selecting random sampling as suggested by Saunders et al. (2009:223). Saunders et al. (2009:140) further mentioned that simple random sampling is best used when you have an accurate and easily accessible sampling frame that lists the entire population.

The report from the research note on Small, Medium and Micro Enterprise sector of South Africa (2016), recorded the number of formal SMEs during 2015 to be 667 433 from nine province in South Africa. The same report maintained that these formal sectors are mostly situated in Gauteng and the Western Cape with a higher income generation whilst the informal sector are more in the rural provinces. Based on the intensity of formal SMEs the study will collect most of the data through the use of survey mainly from Gauteng and the Western Cape Province, however other provinces will also be considered.

3.4. Data Collection and instruments
During this study data collection will occur in two phases as previously mentioned, with the initial collection phase happening during focus groups and interviews, followed by the second quantitative data collection as described in the following sections:

3.4.1. Qualitative Data Collection Procedures
Qualitative data collection procedure will be applied during the first phase of the research study. Data will be collected using in-depth interviews and focus groups interviews where the interviews will only be confined to Gauteng province for convenience.

(a) In-depth interviews
During in-depth interviews data will be collected from experts who are working within the QI and SMEs sectors whilst data from the focus groups will be collected from SMEs managers/owners. In-depth semi structure interview will be the primary data collection method. Saunders et al. (2009:320) argued that this type of interview are non-standardized and normally the most preferred method to collect qualitative data.

(b) Focus group interviews
Saunders et al. (2009:347) described focus group interviews as the type of interview whereby individual group members’ interactions and responses are both encouraged and more closely controlled to maintain the focus. Focus group interviews will be conducted until data saturation point is reached (Saunders et al 2009:234). The questions will be open ended questions to allow the respondents to provide as much information as possible.

3.4.2. Quantitative Data Collection Procedure
A self-designed questionnaire will be used as the preferred data collection method during the second phase of this study. According to Saunders et al (2009:144) a survey is the most common strategy in business and management research and usually associated with deductive approach. Questionnaire will be e-mailed to participants and accompanied by consent forms to preserve confidentiality and non-disclosure agreements between the researcher and the respondents. Deadlines for submission of questionnaire from respondents will be set to allow for better controls and as the deadline draws closer a reminder will be send again to remind participants to submit.
3.4.3. Measures
Table 3.1 below lists thirty items that will be used to measure the following seven variables as depicted in the proposed framework in figure 2.1. (1) Metrology; (2) Accreditation; (3) conformity assessment; (4) ISO standards; (5) Product quality; (6) operational quality; (7) business performance.

Table 3.1: A list of variables and their related measures

<table>
<thead>
<tr>
<th>Variables</th>
<th>Items</th>
<th>Source</th>
</tr>
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<tbody>
<tr>
<td>Metrology</td>
<td>Comparability</td>
<td>Gonçalves and Peuckert, 2011</td>
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<tr>
<td></td>
<td>Traceability</td>
<td>Frenz and Lambert, 2013</td>
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<tr>
<td></td>
<td>Uncertainty reduction</td>
<td></td>
</tr>
<tr>
<td>Accreditation</td>
<td>Competence</td>
<td>Gonçalves and Peuckert, 2011</td>
</tr>
<tr>
<td></td>
<td>Transparency</td>
<td>Frenz and Lambert, 2013</td>
</tr>
<tr>
<td></td>
<td>Political independence</td>
<td></td>
</tr>
<tr>
<td>Conformity assessment</td>
<td>Confidence</td>
<td>Gonçalves and Peuckert, 2011</td>
</tr>
<tr>
<td></td>
<td>Reliability</td>
<td>Frenz and Lambert, 2013</td>
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<tr>
<td></td>
<td>Conformity</td>
<td></td>
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<tr>
<td>ISO Standards</td>
<td>Harmonization of product and procedures</td>
<td>Gonçalves and Peuckert, 2011</td>
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<tr>
<td></td>
<td>Coordination</td>
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<td></td>
<td>Continuous improvement</td>
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<td></td>
<td>Customer satisfaction focus</td>
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<td></td>
<td>Prevention of non-conformances</td>
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<tr>
<td>Product quality</td>
<td>Performance</td>
<td>Kafetzopoulos, Psomas, and Gotzamani, 2015</td>
</tr>
<tr>
<td></td>
<td>Reliability</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Durability</td>
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<tr>
<td></td>
<td>Product quality</td>
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<td></td>
<td>Perceived quality</td>
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<tr>
<td></td>
<td>Conformance to specification</td>
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<tr>
<td>Operation quality</td>
<td>Company’s productivity</td>
<td>Kafetzopoulos, Psomas, and Gotzamani, 2015</td>
</tr>
<tr>
<td></td>
<td>Company’s efficiency</td>
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<td></td>
<td>Company’s process effectiveness</td>
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<td></td>
<td>Company’s competitive advantage</td>
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<td></td>
<td>Company’s ability to have access to new domestic and foreign markets</td>
<td></td>
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<tr>
<td>Business performance</td>
<td>Company’s profitability</td>
<td>Kafetzopoulos, Psomas, and Gotzamani, 2015</td>
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<tr>
<td></td>
<td>Company’s financial results</td>
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<td></td>
<td>Company’s net profit margin</td>
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<td></td>
<td>Company’s sales growth</td>
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<td></td>
<td>Company’s market growth</td>
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3.5. Analytical Procedures

An ordinary Least Square (OLS) regression method will be used to test if there is statistical relationship between QI variables and SMEs performance. The regression model will be developed for each hypothesis testing and be represented by the following formula:

$$Y = \beta_i X + \varepsilon_i$$

Where $\beta_i$ is the regression coefficient for variable $i$ in model $j$,

$i = 1, 2, 3$ and $j = 1, 2, 3, 4$

$\varepsilon_i$ is the error term for regression model $j$,

The regression model for the hypothesis testing will therefore be represented as follows:

Model 1: Independence = $\beta_{11}$ (metrology) + $\varepsilon_{11}$

Model 2: Independence = $\beta_{12}$ (accreditation) + $\varepsilon_{12}$

Model 3: Independence = $\beta_{13}$ (conformity assessment) + $\varepsilon_{13}$

Model 4: Dependence = SMEs performance = $\beta_{14}$ (metrology) + $\beta_{24}$ (accreditation) + $\beta_{34}$ (conformity assessment) + $\varepsilon_{14}$

3.6. Expected Results and conclusions

It is expected that from the regression analysis results there would be a positive relationship between the variables (ISO standard) and (metrology, accreditation and conformity assessment). The direction between these variables will be as postulated as indicated in figure 2.1. Furthermore it is expected that a QI will have a positive influence on SMEs performance with the direction of influence as postulated in figure 2.1.

Furthermore this study will argue that lack of awareness on a QI by SMEs managers/owners may lead to a negative relationship between QI constituencies (standardization, metrology, accreditation and conformity assessment) and SMEs performance.

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The overwhelming support and advice from my supervisor, Professor Ramphal, is immeasurable and I am looking forward to his future guidance.
Figure 2.1: Proposed framework for SMEs performance

Source: Constructed by the author
REFERENCES


