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People Innovation Capability Maturity Model (PICaMM) for Measuring SMMEs in South Africa

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Abstract: The South African Government has recognised the potential of the contribution of Small Medium Micro Enterprise's (SMMEs) to the overall economy of the country. Government and the private sector have introduced agencies and operations to support the development of SMMEs. Given this support, SMMEs continue to face serious challenges and barriers leading to failure, for example, finance, government policy and communication, marketing, infrastructure, limited use of technology, weak business management, inadequate training and skills development. To stem the tide of failure and offer support and solutions, the challenge was to develop a maturity model (PICaMM) which could support South African SMMEs in improving their business processes and improve their overall level of maturity as a developing organization. This paper will indicate how PICaMM can be applied by SMMEs to measure and improve themselves. After PICaMM was applied in two SMMEs through a mixed methodology approach results indicated that PICaMM did support these SMMEs to evaluate their level of maturity regarding the management of the workforce, new ideas, products and services, knowledge, skills and training. Maturity improvement within the SMME is evaluated along a 'step-wise' continuum of staged levels, one to five, where, at the fifth level the enterprise will be able to align its processes and activities with its business objectives to become more successful and competitive in gaining market share.

Key words: maturity models, measuring, SMMEs, South Africa

Introduction

The main purpose of this paper is to provide an overview of how a specific maturity model, PICaMM, can be applied to support SMMEs in South Africa to measure their maturity and to improve themselves based on the results. It should be noted that PICaMM can be utilised by all organisations but for the purpose of the study that was conducted a decision was made to focus on the technological SMME community as a means of supporting their endeavors.

The South African government has set as a priority the development of Small, Medium and Micro-Enterprise (SMME) sector initiatives as a nationally concerning issue. In keeping with global thinking about the role of SMMEs, the government recognises the potential of SMMEs to be strong economic drivers. They have the ability to address critical socio-economic challenges such as unemployment, alleviation of poverty and engendering economic growth.

Nkoana-Mashabane (2010), Minister for International Relations, South Africa, reminds that some of the emerging powers with whom South Africa has intensified its diplomatic relations, namely China, India and Brazil, among others, have been fellow travelers in the struggle against colonialism. Over the years strong ties have been forged with these countries. It is an important history, Nkoana-Mashabane asserts, leading to the present age of globalization. The shared historical ties make it easier to understand the kind of challenges faced as developing countries. Emerging powers offer possibilities for South Africa and other African countries an avenue for trade and investment linkages, technology transfers and technical cooperation in a range of sectors. These possibilities will have an impact on SMME expansion in South Africa and will have the best support available from the South African Government as well as Non-Governmental Organisations, addressed in the next section.

Government Support

According to Agupusi (2007), through the Department of Trade and Industry (DTi) in South Africa, the two key government agencies established for small business development are the Small Enterprise and Development Agency (SEDA) and Khula Enterprise Limited which offer a range of programs to foster new business start-ups and build the capacity of existing ones. Agupusi goes on to say that micro and survivalist businesses have been helped by the South Africa Micro-credit Apex Fund (SAMAF), through Khula, to make financial support available to them, mostly in rural areas and townships. Other governmental agencies which offer assistance to SMMEs include the National Empowerment Fund (NEF), the Industrial Development Corporation (IDC) and the Gauteng Enterprise Propeller (GEP).

Additional to the government institutions and mechanisms, organisations such as the Tshumisano Trust, for example, have assisted SMMEs by implementing the Technology Station Programme (TSP) developed by the Department of Science and Technology to provide technical and financial support to Technology Stations which extends to SMMEs technology solutions, services and training (Tshumisano KPI Report, 2004/5).

Non-Governmental Organisation (NGO) and Private Sector Support for SMMEs

The Small Enterprise Foundation (SEF), a non-profit NGO, states that its goal is to work towards provision of sustainable finance support, with the view to alleviate poverty and unemployment in the rural areas, amongst survivalist groups (Small Enterprise Foundation, 2008).

The Small Business Project (SBP) initiated in 1997, as a small business development agency (Sikhakane, 2003), has set-up the Business Linkage Programme (BLP), in an attempt to link SMMEs to corporate champions as partners (Tyali, 2003). This is just a small sample of NGOs and private sector support.

Further support is offered to SMMEs in South Africa by the major commercial banks, private companies, close corporations and section 21 companies. Given the support that SMMEs receive from both Government and the Non-Governmental Organisation and Private Sector they continue to face serious challenges and barriers leading to failure.

Fakude (2007:198) states that for far too long there has been too much reliance on the big corporates to create jobs and generate growth. He goes on to say that elsewhere in the world job creation and growth happens in the small enterprise sector because it is in the SMMEs that opportunities are exploited, gaps are found and technical expertise is developed and entrepreneurship is stimulated and nurtured.

Origin of PICaMM

Taking into account the many reasons for SMME failure it becomes clear that there is considerable need for improvement. An adaptive model, the People, Innovation, Capability and Maturity Model (PICaMM), has been designed and developed to assist SMMEs to realize improvement along an ascendant path from random processes towards alignment of processes to meet the enterprise objectives and goals. The People, Innovation, Capability Maturity Model, PICaMM, was informed by and derived from well-established quality, maturity and innovation models, as depicted in Figure 1.

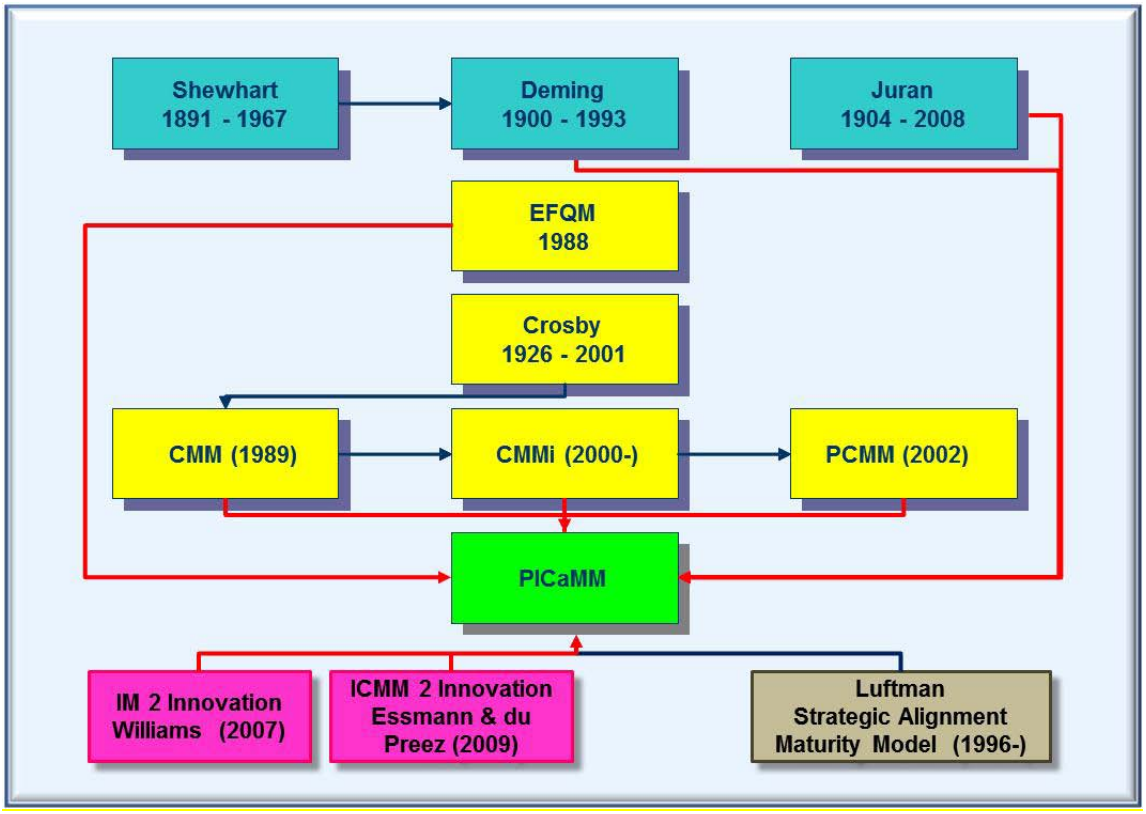

Figure 1: Origin of PICaMM

The antecedents to PICaMM are quality models dating back to Walter Shewhart, William Deming, Joseph Juran, the European Foundation for Quality Management (EFQM) and Philip Crosby who also introduced the quality management maturity grid which was the forerunner to the Software Engineering Institute Capability Maturity Model (CMM). These models provided an insight into organizational quality and capability processes and how they are managed (Curtis, Hefley and Miller, 2002; Kerzner, 2001; Oakland, 1996). The practices that govern the improvement of process maturity in the quality and capability maturity models have been incorporated to form the basis of the Capability aspect of PI**Ca**MM.

According to Curtis *et al.* (2002), the People Capability Model (PCMM) focuses on the development of the employee by providing a framework for the organization to improve employee knowledge, skill and ability, thereby enhancing their practices which would result in improved performance. These principles have been adopted to provide the foundation for the people maturity aspect of **P**ICaMM. A further maturity model is Luftman's Strategic Alignment Maturity Model which describes alignment of Information Technology with business objectives (Luftman, 2000).

With regard to Innovation maturity, the Williams IM2 Innovation Maturity Model and that of the Essmann and du Preez ICMMv2 Maturity Model were studied and analyzed (Essmann and du Preez, 2009; Williams, 2007). Both models provided characteristics and processes that could be applied to growing and maturing organizations, supplying them with evolutionary plateaus for innovative capability improvement. As a result, the salient aspects of each model were adopted to form the foundation for the Innovation Maturity aspect of P**I**CaMM.

For effective maturity improvement to occur the four key stages of the Deming Cycle which are Plan, Do, Check and Act, utilizing the Action Research method, are followed by a phase of consolidation to prevent the cycle turning retrograde into descent. The goal is to create ongoing, steady, ascending maturity improvement, as shown in Figure 2.

Source: Adapted From: ITIL – Continual Service Improvement (2007)

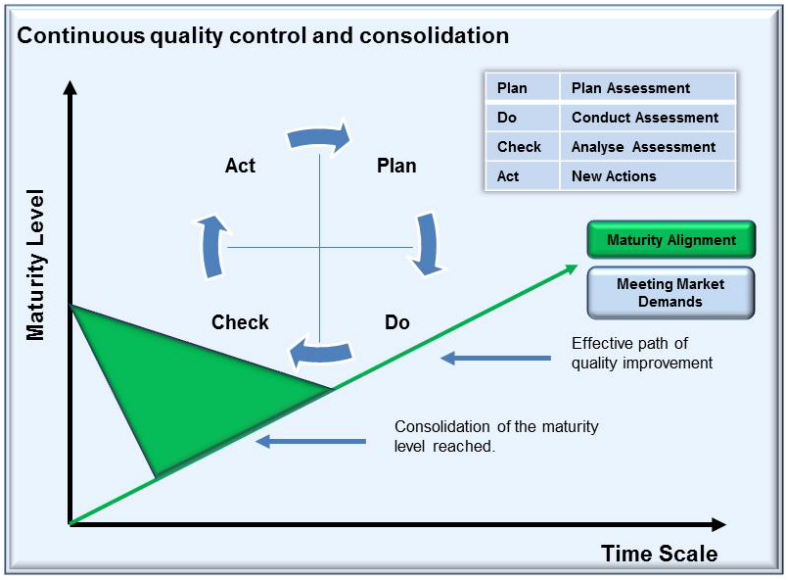

Figure 2: Deming Cycle – Continuous Maturity Control and Consolidation

The key to Plan, Do, Check, Act is given in the top right hand corner of the figure above.

The Principles of PICaMM

By combining people, innovation and capability maturity together with that of quality it is envisaged that PICaMM will provide the SMME with a framework of principles to enable the enhancement of practices which will be infused into the organization leading to optimally aligned organizational transformation, see Figure 3.

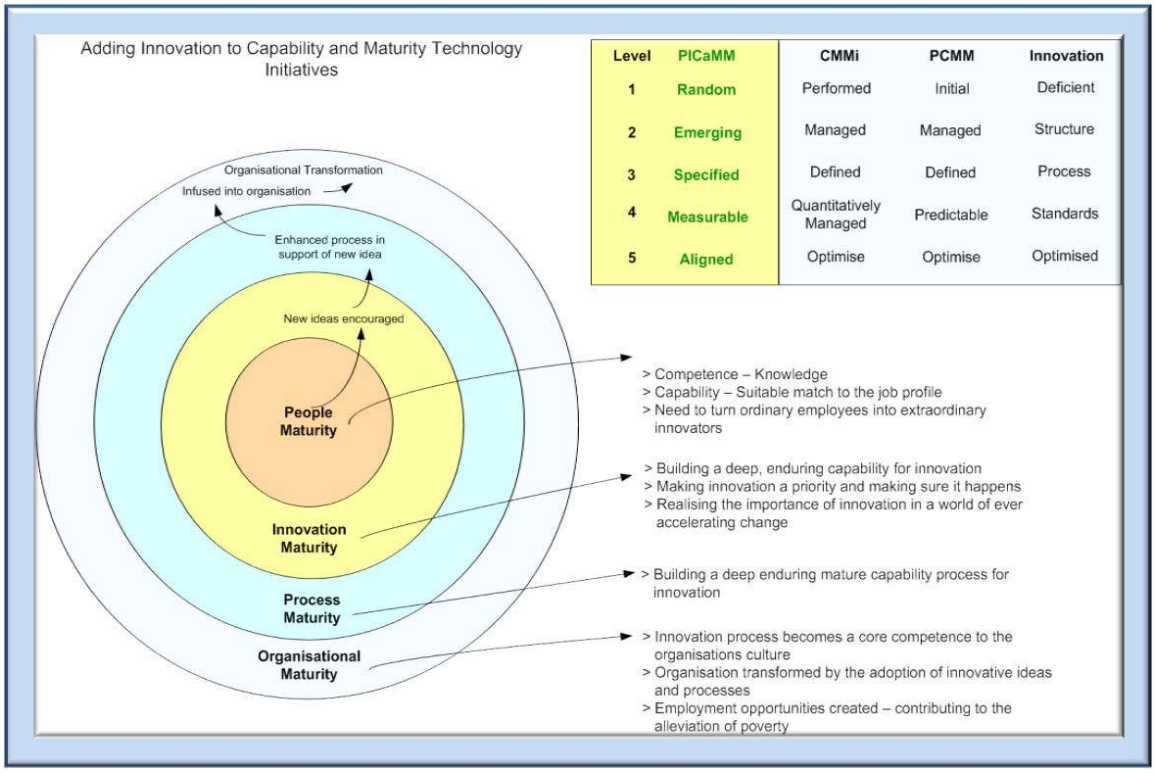

Figure 3: Principles of People, Innovation and Capability

People maturity, in the PICaMM context, refers to the level of inherent knowledge, skill and ability of employees to successfully achieve the company's business objectives.

Innovation is defined as the application of new and existing knowledge, skill and ability to generate innovative solutions to meet the market demands facing the company.

Capability maturity is defined as the application of knowledge, skill and process ability, through competence and efficiency, to become more maturely aligned with ever changing business needs to keep them competitive in their market sector.

Maturity in the context of PICaMM follows a cyclical path and is discussed next.

The Maturity Lifecycle

The maturity lifecycle follows three ethnographic stages, namely, cultural change, maturity growth, maturity alignment or decline. Cultural change starts to take place as a result of initiating the first level of maturity, that is, at the Random Level of PICaMM. This is not to say that the change of the culture of the enterprise happens immediately. It is just the first step in all of the process areas, which are the People, Innovation and Capability of the enterprise along its path towards maturity alignment. The next step in the maturity lifecycle is maturity growth towards the Emerging Level of the enterprise. This is followed, if the maturity growth has been sustained, by the Specified Level, where the process areas are starting to become formalized and defined. From this level the process areas become measurable so that improvement can be replicated, identified in PICaMM as the Measured Level. If these four fundamental levels are not sustained, maturity in the enterprise will decline, as indicated in Figure 4.

Source: Adapted from Lowe and Marriott (2006)

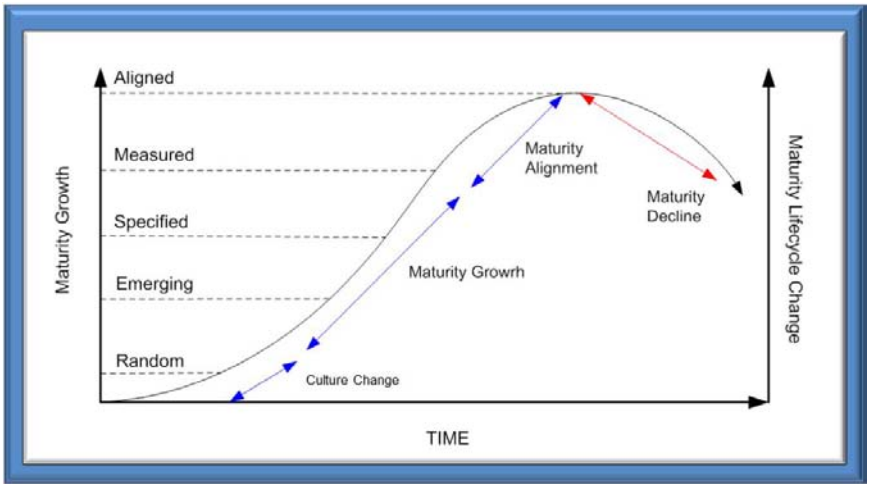

Figure 4: Maturity Lifecycle

PICaMM lifecycle proposes that the organization assesses and measures its maturity status reiteratively, using the principles of Action Research, firstly to determine their progress from the initial AS-IS maturity level to a defined TO-BE maturity level and secondly, to make sure that once the next level of maturity is attained, complacency does not set in, which ultimately results in a regression of maturity.

By ensuring that the maturity of People, Innovation and Capability is continually assessed and augmented, the organization will be able to sustain continuous and predictable improvement of their services and products becoming better able to meet market demands.

PICaMM levels of maturity are specifically defined and will be described in some detail in the next section.

PICaMM Maturity Levels

Failing SMMEs often adopt immature strategies with regard to deployment of employees and management although they may deliver initiatives that produce excellent results from time to time. This, however, is normally reactive or is driven by the effort of a particular person having greater skill in a specialized area of expertise. Sowden, Hinley and Clarke (2008) state that, in the absence of an organization-wide infrastructure, repeatable results that depend entirely on specific individuals who have the knowledge and ability do not provide a basis for long-term success and continuous improvement throughout the organization.

To overcome this ad-hoc intermittent success situation, PICaMM provides the organization with the ability to transition from immaturity to a mature aligned capable organization. To facilitate the progression of people, innovation and capability maturity, from a state of immaturity to one of aligned maturity, PICaMM makes use of a five level maturity framework, shown in Table 1.

Source: Adapted from Williams (2007), Essmann and du Preez (2009) and Curtis, Hefley and Miller (2002)

People Maturity	Innovation Maturity	Capability Maturity
Level 1: Random Inconsistent performance Skills insufficient and training not undertaken Ad-hoc work practices	**Level 1: Random** Not open to new ideas – risk averse. Risk tied to cost Maintaining the 'status quo"	**Level 1: Random** Processes are often partially defined or informally applied Unpredictable implementation Processes ad-hoc and unstable
Level 2: Emerging Managed processes emerge but are still at low levels Limited skill development provided	**Level 2: Emerging** Poorly developed structures to manage innovation	**Level 2: Emerging** Managed processes are still at low levels but there is more planning, adherence to policy, and identified resources and responsibilities produce successful outputs
Level 3: Specified The organisation defines expected competencies Skills development program is defined	**Level 3: Specified** The organisation defines expected innovation processes	**Level 3: Specified** The process is defined.
Level 4: Measurable Competency is quantified and thus becomes predictive Processes become more institutionalised	**Level 4: Measurable** Reasonable risk is tolerated. Metrics, training , campaigns, ideas solicited from employees all become part of organisational strategic plans	**Level 4: Measurable** The process is managed quantitatively Greater performance stability is created and quality and process performance standards are met.
Level 5: Aligned Whole organisation focuses on on-going development and improvement Alignment between organisational objectives and improvements are monitored	**Level 5: Aligned** Entire organisation is involved in on-going innovation techniques with senior management who take on leadership and oversight. A centralised database for new ideas is created. Ideas generation is encouraged.	**Level 5: Aligned** All employees are responsible for continuous improvements Causes of performance problems are more easily dealt with Aligned processes are institutionalised

People Maturity	Innovation Maturity	Capability Maturity
	Innovation is aligned and forms part of strategy planning.	

Table 1: Framework Levels of PICaMM

These five levels of maturity constitute the core structural features of PICaMM represented in Figure 5.

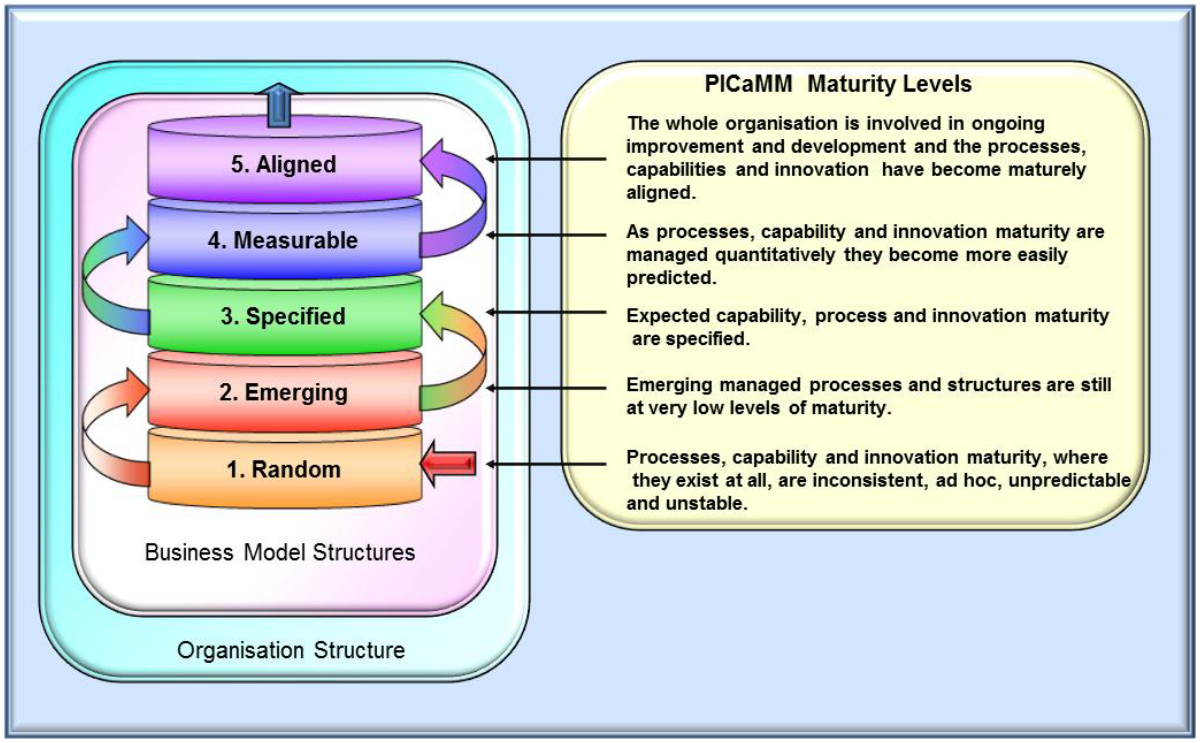

Figure 3: PICaMM Maturity Levels and Functionality

Applying PICaMM, an SMME will be able to focus on the three core maturity process areas and identify the specific maturity level of each. In this way management will be able to determine what is needed to improve the maturity of each level to enhance and build a skilled, innovative, capable organization to sustain and promote commercial success.

PICaMM Assessment Approach

PICaMM was introduced into two separate case studies, each regarded as an individual case. An assessment of the AS-IS maturity of each case to determine a baseline maturity level, in keeping with the PICaMM Assessment Approach, was first conducted.

The approach describes a process that facilitates the assessment of the organizations current and future states of people, innovation and capability maturity. This approach provides a practical reiterative guide for the application of PICaMM, as depicted in Figure 4. It demonstrates a step-by-step cycle of events, namely, Planning, Implementation, Assessment and Analysis, Feedback and Recommendations that are required for performance from one maturity level to the next improved maturity level. This iteration is repeated, through collaboration with all staff members, to decide on a way to achieve maturity improvement.

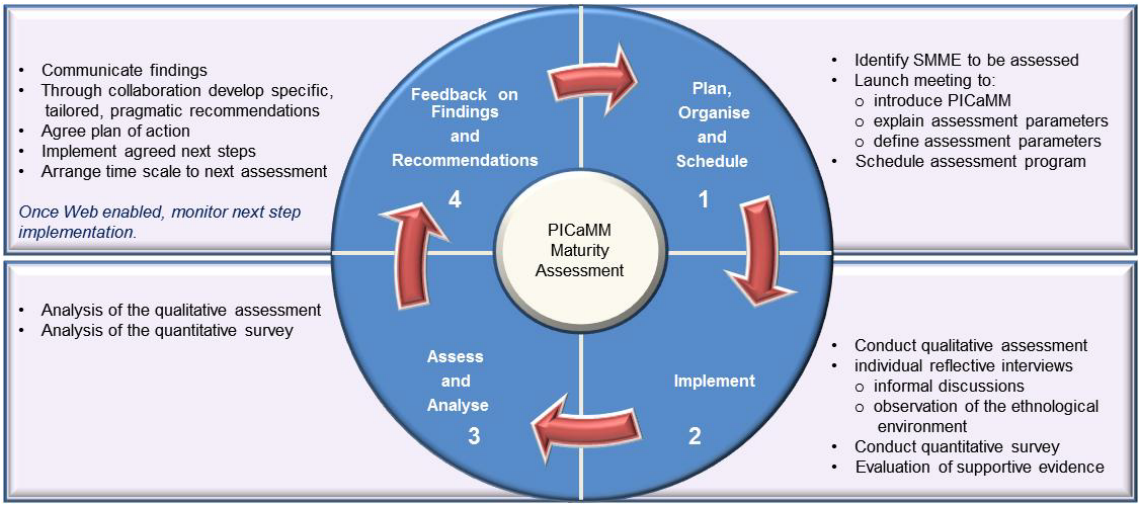

Figure 4: PICaMM Assessment Cycle

PICaMM assessment follows a four step process starting with presenting a conceptual overview of the model to the enterprise followed by step one, the launch meeting, culminating with feedback on findings and collaborative recommendations on next steps. Step four is also the foundation and start of the new cycle, assessing the next step to be taken for continuing the maturity progress of the organization. This is discussed in more detail in the Approach section that follows.

Approach

At the onset of the initial maturity assessment there is no data available providing information on the current maturity status of the organization. To determine the state of people, innovation and capability, a four step approach is adopted, using action research and is presented in Figure 5.

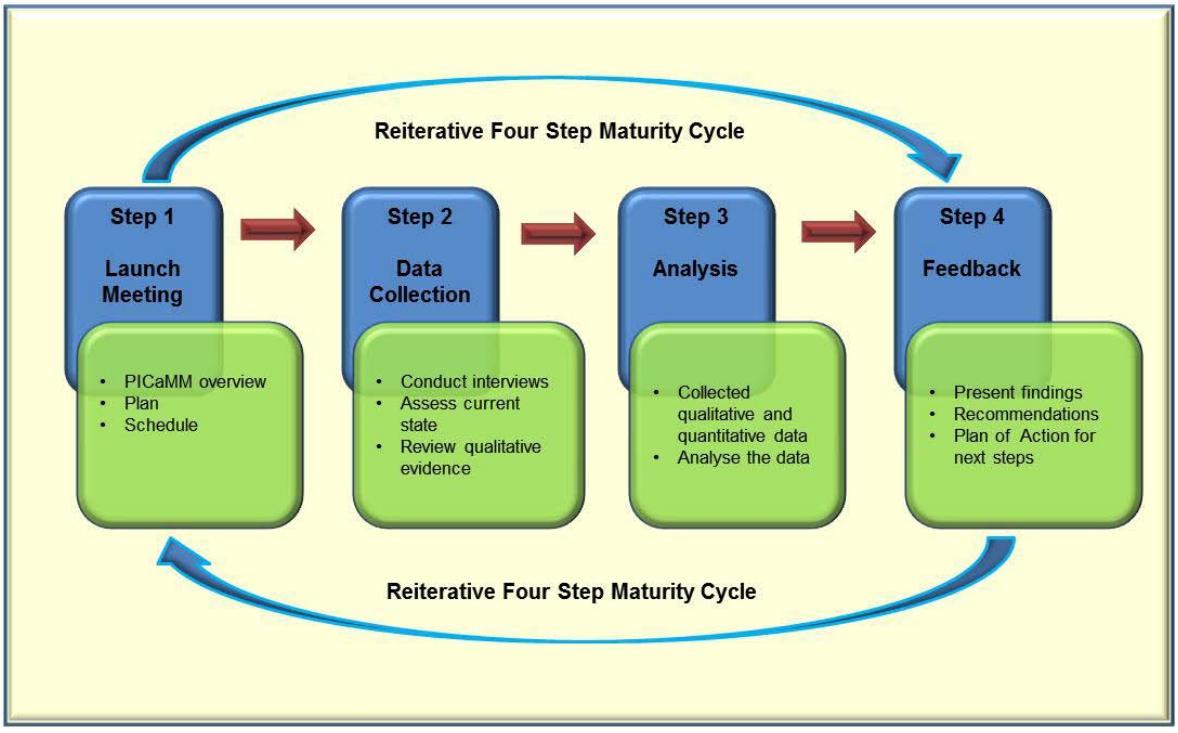

Figure 5: Four Step Maturity Assessment Approach

Step 1 – Launch Meeting

Communication is critical to the implementation success of PICaMM into the organization. A key communication method, in this regard, is the launch meeting. It is the single most important meeting of the entire people, innovation and capability maturity assessment exercise.

The launch meeting, essentially, fulfills four basic objectives, as set out below.

- To start the PICaMM assessment
- To outline the objectives of PICaMM assessment
- To clarify the expectations of employees, management and senior management
- To gain commitment from employees, management and senior management, who will influence the outcome of PICaMM assessment

The format of the launch meeting may vary depending on the size and complexity of PICaMM assessment focus. It may consist of one or more sessions dependent on location and availability of employees.

The purpose of the launch meeting is three fold.

1. To introduce the objectives of PICaMM and to reaffirm anonymity and confidentiality of information emanating from the people, innovation and capability assessment.
2. To present and agree PICaMM Assessment Plan.
3. To discuss and agree the schedule that encompasses the maturity assessment activities.

Step 2 – Data Collection

There are two methods used during the data collection step:

1. A qualitative data collection process is adopted. During the qualitative collection of data, employee's management and senior management are individually and or collectively interviewed. This is dependent on the size and complexity of the organization. Structured interviews are focused on an investigation to obtain clarification and contextualization of interviewee disclosures through a set of standard questions (Leedy and Ormrod, 2005). Semi-structured interviews, while using standard questions may also use some open ended questions which, according to Charmaz (2006), also makes use of informational and subsequent reflective and feeling questions.

   Informal discussions and behavioral observations, 'water cooler chatting', have the tendency to reveal more information about how the individual views the organization, than what would be revealed in a formal setting. In this environment, natural behaviors can also be observed, for example, employees tend to be more vocal amongst their peers about the organization as opposed to when management is present. During these sessions, notes are taken, giving assurance of anonymity. Field notes capturing the responses from the interviews are coded for later analysis.

   Documents in the form of policies and procedures provide a view of how well company information has been structured. Company memorandums can provide information about the rationale on strategic decisions made by management and senior management.

2. A quantitative method is also adopted requiring employees, management and senior management to complete a carefully constructed assessment questionnaire based on the focus and scope of PICaMM. There are three sets of questionnaires, one for employees, one for management and one for senior management. These questionnaires comprise a subset of people, innovation and capability questions (five questions per category) which are complementary to each other as seen in the example provided in Figure 6.

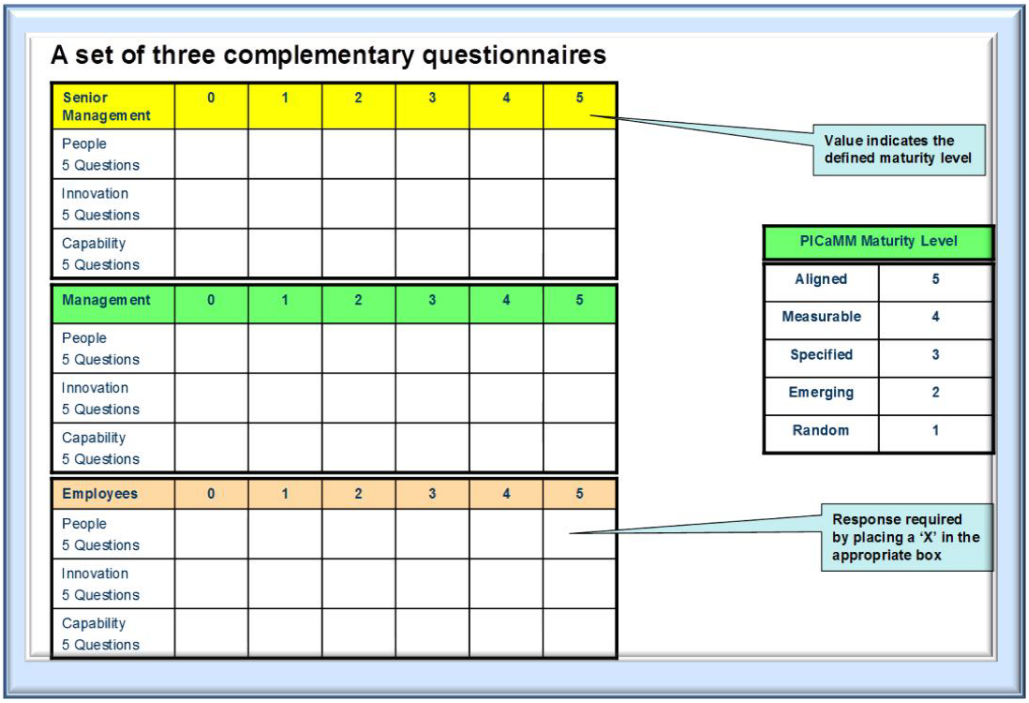

Figure 6: Complementary Questionnaire Structure

Quantitative assessment involves the numerical measurement of data and analysis of the data (Smith, 1998). The assumption is that that there is an objective truth that exists that can be measured and explained scientifically and that the measurement is reliable and valid (Cassell and Syman, 1994).

Step 3 – Data Analysis

Qualitative data collected from structured, unstructured discussion, observation and documentation is thoroughly, accurately and systematically documented using field notes, tape recording and any other suitable method (Leedy and Ormrod, 2005:143).

Leedy and Ormrod (2005:150) state that the assessor begins with a large body of information and must, through inductive reasoning, sort and categorize it and gradually boil it down to a set of manageable themes. By doing so, one can determine the specific characteristics to be analyzed and interpreted. The data collected from the different sources can now be integrated, analyzed and interpreted, culminating in the final report to management. It is during the data analysis phase that findings from qualitative and quantitative data were merged or integrated, according to the mixed method approach adopted in this study, to gain a better understanding of maturity improvement in an SMME than either approach alone (qualitative or quantitative) would have produced (Creswell and Plano Clark, 2011).

Creswell (1998) in Leedy and Ormrod (2005:150) states that, by using the data analysis spiral approach, the data is assessed several times by taking the following steps:

1. **Organization -** Organize the data.
2. **Perusal –** Peruse the entire data set several times to get a sense of what it contains as a whole.
3. **Classification –** Identify general categories or themes.
4. **Synthesis –** Integrate and summarize the data for the report.

This is graphically depicted in Figure 7.

Source: Leedy and Ormrod (2005:151)

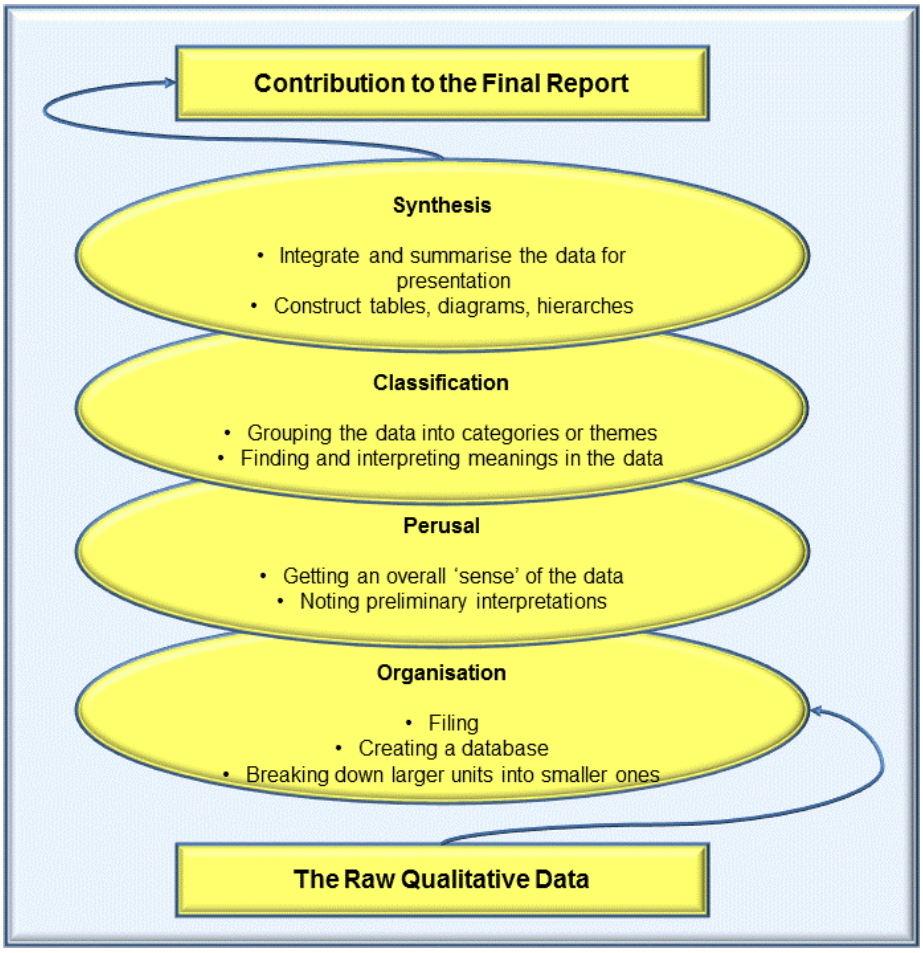

Figure 7: Data Analysis Spiral

The data collected from the quantitative assessment may be rated using the construct of the Likert Scale to determining the attitudes of the participants. Each response to the questionnaire is captured onto a spreadsheet using Microsoft Windows Excel. This enables management of the volume of information gained. Describing the use of spreadsheets, Welman & Kruger (2001:313) explain that each column is occupied by a variable and corresponds to a question in the data collection questionnaire. Each row is dedicated to a respondent. The results of the analysis determines the degree of maturity with regard to the people, innovation and capability maturity of the organization using a five point scale ranging from random (1) to aligned (5). Data from the Microsoft spreadsheet is then imported into an SPSS data analysis software tool applying Crombach's Alfa Coefficient and a number of non-parametric tests, executed on all of the responses to the questionnaire representing the measuring instrument of the survey. The aim of this analysis is to provide the current state of maturity of the organization.

Once the data has been collected, the results are interpreted through deductive reasoning. This implies that meaning is added to the data (Oates, 2008). Oates, (2008) further suggests that the following is to be considered when putting meaning to the data:

- What do the results show?
- What do they imply?
- How do they relate to other reported research in the literature?
- What is important in the results?
- What relevance do the results have to PICaMM assessment?
- What relevance do they have for the organization?

Step 4 – Feedback

Feedback report involves provision of an overview of PICaMM assessment method, which could include:

- Results of self-completion questionnaire, face-to-face interviews and observations;
- a full description of the maturity assessment evaluation methods;
- who took part in the maturity assessment (numbers per category, for example, how many employees, management and senior management took part); and
- description of the attempts to follow-up people who did not respond to the data collection.

Provision of the feedback repor includes a section which addresses the results and findings of what the data has revealed, presenting the quantitative data as graphs and or tables where appropriate and presenting the qualitative data as descriptive themes.

In the conclusion of the report, recommendations are given for improvement along the PICaMM continuum. The recommendations are followed up with a collaborative plan of action, with input from the SMME and the assessor, with the aim of the SMME progressing to the next maturity level.

Summary and significance of the study

In summary, PICaMM focuses on improvement of the SMME to transform it to evolve into a competitive, successful and mature entity.

Many maturity models can be identified and are in daily use as business solutions where companies seek improvement in their organisational practices. PICaMM differs in an innovatory manner from previous models by:

- it's grouping of process areas, namely, People, Innovation and Capability;
- offering SMMEs a technology driven business solution model which is collaborative, supportive, adaptive and interactive through Internet interconnectivity, should they wish to choose this option;
- training occurring organically during the implementation lifecycle through hands-on experience *in situ* so that learning is accomplished through practice;
- the initial appraisal being led by a PICaMM expert – subsequent appraisals may be carried out by the user organisation while still being supported by the model expert;
- no imposition of the model and the maturity levels being described straightforwardly and thus not intimidating;
- being ideally introduced at the start-up phase of the enterprise so that it becomes inculcated into the culture and structures of the enterprise;
- adopting a pragmatic approach through applying a practical technique to the maturity lifecycle of the organization so that it continues along a path of improvement.

Contributions and benefits to sustainable development and maturity improvement in SMMEs through the use of PICaMM are proposed as:

- Provision of comprehensive strategic and operational advice;
- Assessment/evaluation of current situation in collaboration with the SMME;
- Reaching an understanding of specific business drivers of the identified SMME;
- Provide targeted technical support;
- Support for business units;
- Development of the potentiality and effectiveness of the workforce of the organisation;
- Improving operational and performance practices and performance evaluation;
- Specification and measurement leading to greater process control, which allows improvement to be more successful;
- Introduction of appropriate technology, innovation and skill are more likely to result in more successful outcomes;
- Embedding best practices and due diligence methods;
- Business optimisation;
- Develop a consultancy to facilitate skills and knowledge transfer;

- Support and direction for using PICaMM from initial level of operation to reach an aligned level of innovation and capability performance as an organisational asset.
- Improvement of SMMEs in South Africa and the upliftment of emerging enterprises to give them a better chance of success.

A high-level overview of PICaMM contributions and benefits is graphically represented in Figure 8

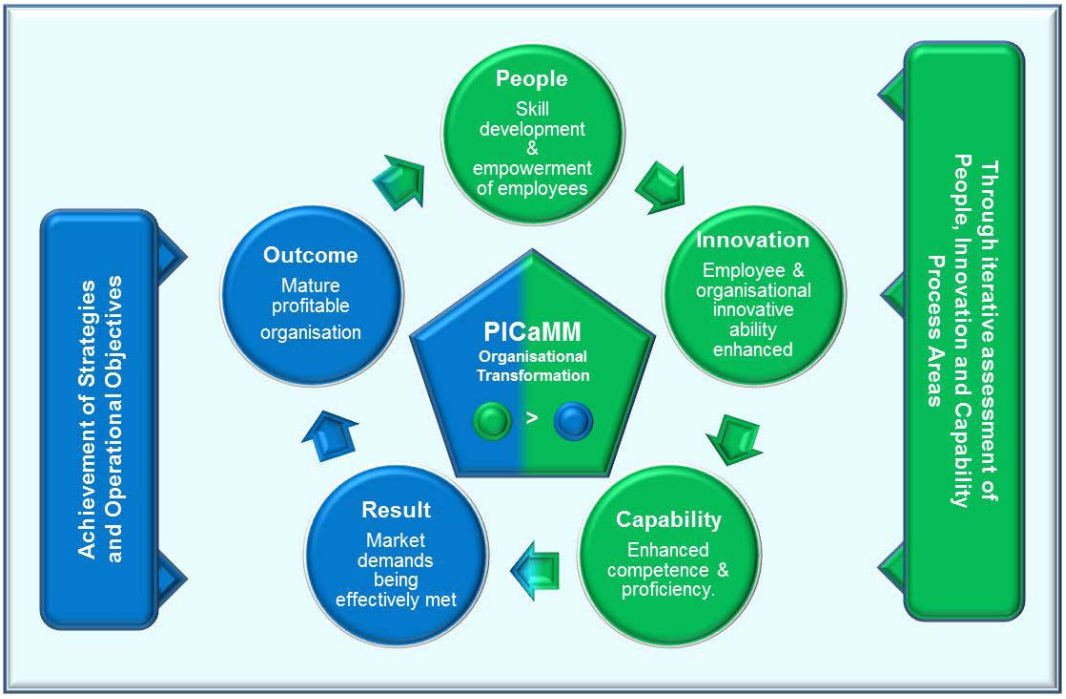

Figure 8: PICaMM Contributions and Benefits for SMMEs

PICaMM would be fundamental in its contribution in assisting SMMEs to overcome the most inhibiting factors that cause failure, for example, weak business management, inadequate training and skills development, technology, enabling the achievement of their strategies and operational objectives in meeting the market demands in their area of business.

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