ASSESSING THE EFFECTIVENESS OF ISO 55000 STANDARD IN SMALL TO MEDIUM SIZED ENTERPRISES (SMES).

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Abstract

The increased economic and market globalization means the criticality of standards and its role in exploiting network externalities has had an influence on increasing productivity, and efficiency, decreasing non value added information and promoting process management. The ISO 55000 series is a comprehensive and detailed standard, which helps to create an improved methodology to implement an asset management system within an organisation. Asset management is an important part of any organisation, as it allows them to extract value from their assets. ISO 55000 series consists of three segments namely ISO 55000, ISO 55001 and ISO 55002, which aims to provide a standardised framework for an asset management system. AM is a combination of management, financial, economic, and engineering activities and the effectiveness of a universal view has been acknowledged but is not wholly developed especially within small to medium sized enterprises (SMEs). The document, could be seen as limited as it states what should be done, not how to do it.

1. Introduction

The recent fall in oil prices and a continuing poor economic outlook has created an environment where businesses are on the edge of a new trend in asset efficiency and improvement, while companies face the risk of economic loss by not managing their asset. Companies are attempting to implement systems for managing the life cycle of their most critical assets based on the ISO 55000 standard. ISO 55000 requires a strategic approach in determining the criticality of an asset and the asset systems, and apply an appropriate 'weight' when making decisions. In the context of ISO 55000, companies should consider maintenance schemes centred on condition monitoring and reliability methodologies for assessing risk of their asset and information systems in which the condition, the operational history, failure reports, executed maintenances, involved costs are recorded for further analysis. These systems support the decision-making process, where the asset manager is able to decide the most appropriate actions over the asset in pursuit for the objective for which the asset was conceived in a manner consistently and sustainable.

Most organisations that make extensive use of physical assets often take them for granted and they tend to focus their attention on what they do. Managing assets

today is more complex, yet in many organizations, the management of those assets is often unfocused and inappropriate.

SMEs are seen as key to the creation of financial growth and competiveness. Within Africa approximately 95% of all companies are SMEs and create over 80% of output and jobs. Therefore, it is necessary to ensure SMEs are able to design, develop and implement the tools and techniques, such as ISO 55000 to remain competitive and sustainable. Complying with ISO 55000 contributes towards realising optimal value from assets. However, critics view ISO 55000 as an improvement tool for large companies and not a system, which could easily be adopted by SMEs due to the complexity and large number of sections. Therefore, a review is required of the entire framework and sections of ISO 55000 in order to overcome the perceived and often inherent constraints and impediments, found within SMEs.

2. Small to Medium Enterprise (SMEs)

SMEs are often seen as the drivers of innovation and financial growth and attract significant foreign reserves into the country and generate employment, which makes them the backbone of private sector all over the globe (Al Mahrouq, 2010). There are three broad parameters that are being used to define SMEs:

- Micro entities are companies with up to 10 employees,
- Small companies employ up to 50 workers,
- Medium-sized enterprises have up to 250 employees.

However, some countries set the limit at 200 employees, while the United States considers SMEs to include companies with less than 500 employees (OECD, 2005). In the present economic decline, growth is most likely to come from SMEs since they are more flexible than larger companies, which allow them to respond quickly to indications from the market (Revilla, 2012) (Thomä J. & Bizer, 2013). The fascinating feature of SMEs is that they have similar challenges in most countries whether developing or developed, nevertheless, the level of challenge varies from country to country, industry to industry and depends on organisations characteristics.

The greater the numbers of SMEs in a particular nation, the more important is the SMEs role for achieving sustainability. Therefore, given their importance in all economies, they are essential for the economic recovery. Despite many contributions, SMEs are overwhelmed by high failure rates and poor performance levels" (Jocumsen, 2004). Most SMEs primary interest is survival without concern for competitiveness and growth. The difficulty in overcoming obstacles found in areas of competition, technology, markets, production capacity, product range, level of entrepreneurs' skills and product quality assurance contributes to SMEs mortality rate (Murphy, 1996).

SMEs are expected to chase latest opportunities beyond national borders; this creates more pressure to reinforce technological and organizational competences. The challenges faced by SMEs are linked to the developing phase, which includes lack of managerial competences, poor decision-making, scarcity in finance and human resource. Lack of human resources in SMEs drives them to outsource to progress their organisation. The main challenge for modern SMEs is lack of finance and deficiency in essential proficiency, the

management process in SMEs is characterized by extremely personalized choice, biases and attitudes of the companies' entrepreneur, owner (Jennings and Beaver, 1995). It can be argued that SMEs are often limited by lack of finance or time to implement new strategies that allow them extract value from their assets. However, research has shown that SMEs are often precluded due to their perceived and real barriers, and success may be limited, therefore large companies are seen as enablers to ISO standards, which is adequate and suitable for industry. These intensify the need for value creation among SMEs to guarantee business sustainability. As business size increases, it becomes tough for organization to perform functions of control and supervision, all procedures will be taken on financial and administrative level.

3. ISO 55000

The recently released ISO 55000 series aim to provide a standardized framework for an asset management system. This standard is more comprehensive and detailed, creating a clearer way to implement an asset management system within any organisation. These standards apply to any organization, as long as the assets are important key factor in achieving business goals. The ISO 55000 family of standard comprised three documents:

ISO 55000; provides critical overview, concepts and terminology;

ISO 55001; specifies the requirements for an effective Asset Management System;

ISO 55002; offers interpretation and guidance for such a system to be implemented.

ISO 55000 standard is for organisations that establish, implement, maintain, and improve asset management systems (ISO/CD55000, 2012), it allows them to extract value from their assets. The standard informs the reader of how to implement and maintain an asset management system at all management levels of an organisation by providing guidance of what should be done. It also gives insight into the planning, operation, and support activities that go with such a system.

ISO 55000 series of standards is built on the general Plan, do, check act (PDCA) framework, which is recognized as the basis for continuous improvement in management systems. The adoption of the ISO 55000 series of standards will give assurance to its regulators, clients and investors, by assisting the organization to achieve its objective efficiently. Implementation of the standard boosts proactive maintenance of assets such as plants and this would lead to less failure, few wastage and improved service. ISO 55000 helps organizations establish an Asset Management System (AMS) for optimizing assets, this system communicates with elements that produce policy, objectives and procedures to accomplish an organization's objectives. The key benefit of ISO 55000 it provides a minimum set of requirements for an effective asset management system, but allows the organization itself to determine how best it should be implemented to suit their needs; however, this would first require the company to understand ISO 55000.

Observing these requirements (ISO 55001) allows for consistent decision-making on activities that impact asset-related risks, performance, and cost profiles. This indicates that management should be equipped to make objective, predictable, and consistent decisions that involve trade-

offs between short- and long-term effects, and optimal combinations of interrelated and conflicting benefits. ISO 55001 specifically requires that "the method for decision-making and prioritizing of the activities and resources to achieve its asset management plan(s) and objectives shall be documented" (ISO 55001, Section 6.2.2, p. 4). ISO 55000 further requires that the organisation "shall retain appropriate documented information as evidence of the results of monitoring, measurement, analysis and evaluation" (ISO 55001, Section 9.1, p. 9).

In implementing ISO 55000, this report proposes that asset management strategy that focuses on asset care be introduced to the industry. This would enable the organizations to develop and sustain its competitive environment. In order to achieve the product quality goals, manufacturers not only require on going efforts to improve the product and process quality, but it is also required that equipment operates at peak performance. The reliability and productivity of capital assets is essential to the financial success of the organization. According to (Raguram, 2014) and (Tsarouhas, 2007), manufacturing equipment is a major concern of manufacturing organizations as equipment breakdown; repair or quality defects can affect the quality, cost and delivery time of the product. Therefore, it suggested that maintenance activity is important for overall performance and optimization of the asset life cycle (AberdeenGroup, 2006).

4. **The asset management system requirements described in ISO 55000 are;**

Organizational context

An organization should define the external and internal drivers and constraints relevant to its purpose and ability to achieve the outcomes of its AM system e.g. regulatory, financial, organizational culture and environment and values of the organization. The influences of stakeholders are key to setting rules for consistent decision making and also contribute to the setting of organizational objectives, which in turn, influence the design and scope of its asset management system.

Leadership

Top management should be involved in setting up asset management leadership. There should be an established asset management policy align with the organizational strategic plan (it has to be clear and reviewed), the AM leadership is given the authority, charge and resources to achieve the branded objective. leadership and commitment requires that top management ensure:

- Continual improvement
- AM integrated with business processes
- Adequate resources available
- Establish an Asset Management Policy
- Alignment with organizational strategic Plan

Planning

Organisation should have details of how it will deal with risks, opportunities and its AM objectives. Plans describe what the organization will do to execute on AM. The standard outlines a number of requirements that those plans should meet and consider. These integrated plans should address what will be done, when and who will do it, and how it will be undertaken and evaluated.

Support

Cooperation and collaboration with other functional areas will be required for effective AM and execution of the AMS. Information systems must be accessible to back the process; information should be documented, controlled, communicated and auditable. AMS should stipulate the competency requirements for personnel involved in AM.

Operation

Plans and processes for the implementation of the AM plans should be fed back into the design and operation of the asset management system, including any activities that are outsourced, and involves change management activities.

Performance evaluations

Organizations must determine what needs to be monitored and measured, the methods to monitor, measure, analyse, evaluate and validate results, when it shall be done and what results should be analysed and evaluated. This is used to report on asset performance, asset management performance (including both financial and non financial results) and the effectiveness of the AM system itself including risk management.

Improvements

Ensures that non-conformities with respect to the assets are documented and evaluated. Nonconformity requires corrective action and the prospective nonconformities require preventive action. Continual improvement of assets, AM and AMS.

5. ISO 55000 influence in maintenance

The challenge for organisations is the necessity of maintaining and often increasing, operational effectiveness, revenue and customer satisfaction, while at the same time reducing capital, operating and support cost (Mitchell, 2002). Many SMEs simply are not aware of how to improve maintenance processes or if they are, they think that it will cost them too much to do so and this perception flies in the face of the facts. Maintenance and reliability processes, programs fit within ISO 55000, the new Standard is definitely not about maintenance and reliability but it spans the entire life cycle of the assets: design, engineering, procurement, installation, start-up, operation, maintenance, restoration, decommissioning, and disposal. A popular term for the process is 'from cradle to grave'.

ISO 55001 require an organisation to set up a life cycle management plan that include the risk associated with the specific asset and the consequences of this risk. The process of determining when machinery will fail helps to determine the life cycle of the assets and how to manage the asset efficiently. The ISO 55000 series puts a strong emphasis on continual improvement and preventative action and these requirements are given in Section 10 of ISO 55001.

ISO 55000 standards proposed that asset management guarantee assets fulfilling its required purpose. Organisations should develop and implement processes that connect the performance and purpose of assets to the organizational objectives, implementing these processes to assure capability across the life cycle of assets, providing monitoring and continuous improvement and providing necessary resources and competent personnel to demonstrate assurance by commissioning asset management activities while operating the asset management strategy.

6. Proposed key components of ISO 55000

Leadership: Leadership and a constructive workplace culture contribute to realizing the value. Thus it is required from the organization to establish leadership and commitment from all managerial levels to successfully establish, operate and improve asset management within the organization. Therefore, the roles, responsibilities and authorities must be defined, the employees must be informed and empowered, training as well as consultation with employees and stakeholders will be required. Top management and organization must share a common objective.

Planning

Planning is a key element of AM System, which address both risk and opportunities, considering how they may change with time and organization. Objectives require plans for their achievement and those plans should include the various activities, resources and other financing. Organization must have distinct asset management plan, ensuring risk management and measurable objectives. These integrated plans should address what will be done, when who will do it, and how it will be undertaken and evaluated.

Performance evaluations

Performance and efficiency of the Asset Management System (AMS) must be monitored, measured, analyzed, evaluated and auditable. Top management should review the AMS for suitability, adequacy and effectiveness. Results of performance management activities should be kept as documented information. Performance evaluation in combination with estimation of failure consequences provides an understanding of risk. ISO 55000 specifically calls for effective data management and transformation of data to information for measuring asset performance.

Improvements

Failure occurs as a result of an inadequacy or non-conformity within the AM system. Actions to control and correct are required along with dealing with consequences. An evaluation of the need to eliminate the cause is required to ensure that it does not happen again or elsewhere. Once decided upon, action is taken to correct and those actions are reviewed for effectiveness. If necessary, the AM system should be change. Again, documented information is required. The organization should establish processes to identify potential failures in asset performance and evaluate the need for preventive action.

Recommendation

In light of the all that have been discussed here, it is clear that ISO 55000 does not take the place of maintenance strategy, companies must have a holistic maintenance strategy that will aid in improving the overall effectiveness, performance and maintenance functions in an organization. All physical assets in an organization are not equal in terms of value proposition, some are more critical to achieving the objectives of the business than others, SMEs could implement ISO 55000 on their critical asset to reduce cost. Likewise, some assets present a higher degree of risk to business goals than others.

ISO 55000 requires everything be documented including the processes, procedures, etc. and the measurements and other reports that provide evidence of compliance. Clearly there is a need to collaborate with other functional areas within the organization, most notably

finance, human resources, information management and top management. The training and learning of every staff needs to be enhanced with theory to guide practice and gradually introduce the concept of risk to asset management, and penetrate into all aspects of operations management. By establishing and implementing suitable assets management system, risk can reduce; performance and competitive advantage will continuously rise, helping improve the company's social image and reputation.

when planned asset management system is established or reviewed, it is essential to ensure the method is consistent and aligned with internal and external context of the organization. It is necessary since it can influence the scope and design of the asset management system, the organization should make a clear statement how the asset management objectives will align with the organization as well as establish a decision-making process that reflects stakeholder need and define value. it is mandatory to implement a risk-based, information-driven, decision-making and planning process to transform the organizational objectives into asset management plans. Also, the organizations must strive to integrate the asset management processes with the functional management processes.

Conclusion

ISO 55000 is the first standard to widely capture the applicable 'must do' items for the management of any asset. Particularly it is essential for huge, asset intensive and increasing distribution assets; ISO 55000 does not define the 'how to', as it depends on organizational context and the assets to be managed. Companies that are implementing or aim to implement ISO 55000 are better positioned to proactively react to dynamic markets, increasingly stringent regulatory pressures, and demanding shareholders.

The existence of ISO 55000 provides significant opportunities to re-examine and refine asset owner and service provider relationships, governance and regulatory frameworks and insurance, customer relations and other stakeholder confidence. Global practices have shown that asset management can improve the economic efficiency of an organisation by consciously focusing on life cycle, value realization. ISO 55000 allow organization to improve assessment of financial position and funding requirements in relation to assets (ISO 55001, section 2.5.2, p. 6).

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