

## CORPORATE CULTURE AS A STRATEGY FOR MAINTENANCE EFFECTIVENESS IN NIGERIAN ELECTRIC POWER INDUSTRY

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**Abstract:** This paper focuses on the importance of corporate culture. The importance of corporate culture has been recognized by the electric power industries in the advanced economy, but has little or no attention in the Nigerian electric power industry. This paper aims to develop a framework for corporate culture methodology for strategic use in the Nigerian electric stations in order to enable them audit current approaches, revise where necessary, and then implement in order to produce maintenance programmes which are proactive. Objective of the study is to gain understanding of maintenance culture through implementing intellectual capital, organizational learning, benchmarking, leadership and core competence.

**Keywords:** Maintenance strategy, corporate culture, learning, leadership, Nigeria electric power station, bench marking

### Introduction

Today's economic and competitive environment requires that industry sustain full production capabilities and minimize capital investment. From the maintenance perspective, this means finding ways to maximize equipment reliability and up-time, and extend plant and equipment life through cost effective maintenance. To achieve these objectives, the industry must move away from the traditional reactive maintenance mode and over to proactive maintenance and management philosophies. The Nigeria electric power industry must adopt maintenance processes that fully address processes which realize the value of integration, engineering, planning and corporate culture in their processes.

Organizations round the world are looking for new approaches to maintain or develop competitive advantage. Corporate culture could be an approach. Corporate culture focuses on two strategic ways of developing a competitive advantage. First, concentrating on the organization's resources and investments on what it does best called core competences, and second, corporate culture concentrates on activities or strategic needs and special capability. Corporate culture allows organizations to maximize the return on their internal resources; maintain and develop core competences such as providing barriers to protect against present and future competitors; make full use of external and internal capabilities, innovations and investment; and finally, provide better service, equality and cost to the customer. Many organizations have had great success in using corporate culture to gain competitive advantages. In addition, many organizations have turned to corporate culture in an effort to improve the efficiency and quality of their processes.

Where up time, capacity and precision of equipment are critical, organizations have begun to look at corporate culture for maintenance activities.

Even before any serious steps are taken towards corporate culture, however, it is important to develop an overall approach or plan. This plan should involve complete support from management and full participation of the people most affected by it, as well as the co-operation and maintenance workforce. Once an overall plan is in place, the next step is to assess the company's readiness. It appears however that no real effort has been made to study whether maintenance is, or should be, managed differently in the Nigerian electric power stations. For this study the question has been: what differences exist in the way maintenance functions are handled in the Nigerian electric

power industry? The purpose has been to explore and describe the influence of national culture on the way maintenance is practiced in the Nigerian electric power industry.

Unlike most countries in the civilized world, Nigeria has no maintenance culture, i.e., has no cultural concept of “maintaining” things. It is a general belief that Nigerian industries maintenance performance is disorganized. They cannot cope with high rework rates, ignoring statistical (and other) tools to identify, measure and reduce (or eliminate) rework. They lack substantial maintenance coordination and improvement opportunities which include ongoing: continuous improvement; and innovative jumps. Nigerian culture does not support innovative leaps and always has not. Yet tools to improve worker focus and work coordination are more available all the time. Computerized maintenance planning promises better coordination. The widespread availability of personal computers (PCs), Local area Networks (LANs), and other electronic tools greatly enhance the ability to coordinate work. There is so much equipment in power station plants that “just doing work” doesn’t cut in. maintenance work must be structured and focused to high levels. Until now, maintenance practices in Nigerian electric power stations haven’t changed in part because environments support “business as usual”. The power stations must first understand basic maintenance work practices to be able to invoke meaningful maintenance changes and better serve plant needs. Delivery of better services, once understood, is another issue. Just knowing what to do has limited value. Delivery is equal partner to knowledge has to be packaged into delivery methods and systems that integrate with the organization to provide lasting benefits.

The Nigerian electric power stations cannot change without a good organizational culture. There are certainly extraordinary external forces working on them. These forces are competitive pressures - and a growing awareness the maintenance both directly and indirectly offers tremendous potential for cost improvements - have changed this perspective.

#### *Organizational Culture*

Organizational culture is defined as the personality of a company which represents a specific set of common perspectives such as: norms, guiding beliefs, values, customs and modes of behaviours . [1] classifies predominant corporate culture as neither power, role, task or person; hence, insists that it is common for sub-cultures to exist within individual departments, groups or teams.

An organization's culture can be developed through company policy and operational processes, with an appropriate management style. The management leadership attributes should have an affinity with the desired culture. Although there is no single best choice of culture or management style. Each can be effective or ineffective, depending on the situation to which it is applied. The company has to develop a more open and supportive culture to encourage learning, cooperation and team work to improve performance. The company should develop a management style, which is known as team management, and has high concern for both production and people based on the Black and Moulton managerial grid.

The curious paradox exists that organizations can influence the behaviour and values of the individual, while the organization itself is constructed or composed of the individuals. They respond to an organizational environment as a result a combination of positive and negative rewards. Organizations also develop in response to their environmental influence. Over these phenomena contribute to a tendency toward uniformity of organizations of within the greater environment. An organization adopts values that reflect the people in change and the environment with which it has to cope. People working in the organization become aware of the value system, either consciously or unconsciously, and guide their actions accordingly. These actions can manifest themselves as company policy or internal customs and mores. The culture of an organization comes about through the development of norms and values that help it to survive given the environment in which it was created and in which it exists. At any given point in time the environment will be somewhat different from how it was at a previous point in time.

In practice, economy and cultures are very much related. A broader view of change over time would suggest that the best way to examine today's environment for course of action is to look at responses to similar environments at previous history. In particular, in examining how cultures develop, how the broad environmental culture develops over time; how smaller cultures respond to those broader environments; and how business organizations respond to those environments, some predictions can be made about the appropriate responses to today's environment. An

organization evolves in parts in response to the pressures of the outside society, or the social content in which that organization was created and in which it exists.

- i. making things happen - ability to bring the best out of others and make them improve their standards at all time;
- ii. intuition - ability to sense that a problem exists, to react to them in the right way, to make experience work, use data analysis effectively;
- iii. problem management - ability to manage series of problems in an orderly and most effective manner;
- iv. leading by example - making others feel wanted and important; helping them fulfill their goals and expectations, facilitating climate of individual growth and development.

Strong leadership is much affected by various processes which can facilitate or inhibit what managers desire to achieve. Corporate culture cannot be modified easily until all the other aspects of organizational systems have been set right. Corporate culture is reflected everywhere within what is good or bad about organization. It is also argued that in the context of maintenance culture, the major focal point is the type of leadership which is inherent, since things can only happen if people at the top dearly wish them to do so. For the Nigeria electric power industry to deal with various complexities and frequent changes, this has to be strong leadership to direct the organization forward and strong management to pull the strings together.

### Intellectual Capital

Intellectual capital is an important value driven in today's organizations. One of the characteristics of contemporary organizations is their clear ambition to develop performance management systems and practices. The agenda calls for more emphasis on the management of resources not conventionally recognized as management concerns. This includes attention to knowledge and intellectual capital [2]. Not only do organizations recognize a need to somehow develop "integrated" performance management systems [3]; so does the capital market [4]. In addition, strategy is not anymore only about positioning the organization vis-a-vis its competitors. It is concerned also with intangible assets and intellectual capital in the forms of know-how of employees and management, relationships with customers and suppliers, information technology or appropriate organizational form and relevant forms of empowerment - the knowledge based resources [2],[5]. Such resources are often difficult to replicate and thus may create extra-ordinary value.

Intellectual resources comprise of the organization's knowledge. In a business context this knowledge is used to improve and organization's capability, processes and performance. However, knowledge is "intangible". Therefore, it has to be translated into knowledge resources that can be described in an intellectual capital statement. [6] defined four types of knowledge resources as:

- i. Employees are knowledge resources with inherent attribute such as skills and personal competencies, experience, educations, motivation, commitment, or willingness to adapt. Group of employees produce beneficial emergent qualities;
- ii. Knowledge resources based on customers and partners. Especially the relationships to customers, users and other partners such as suppliers, their satisfaction and loyalty, their referral of the organization, insight into users' and customers' needs and the degree of cooperation with customers and users in product and process development, etc.
- iii. The virtual infrastructure can be a knowledge resource as it includes procedures and routines. These can be the organization innovation processes and quality procedures, management and control processes and mechanisms for handling information ; and
- iv. Technologies are based assets as they refer to the technological support of the other three knowledge resources. Focus is usually on the organization's information technology (IT) systems (software and hardware) such as the internet, IT intensity, IT competences and IT usage.

An organization's knowledge management is therefore concerned with the above knowledge resources and their interaction. When the interaction between these knowledge resources is understood, the organization's knowledge management strategy is clear [7],[8].

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The business world has enthusiastically adopted the idea that knowledge has become the most strategic of corporate assets, the principal basis for competitive advantage. While it is important to understand the strategic significance of the different kinds of organizational knowledge, it also raises operational issues for managers. Knowledge is the most important source of competitive advantage. Terms and ideas such as knowledge-based theory of the organization have emerged over the past decade [9]. They match recent significant developments in management theory and practice, especially the increased application of IT to handle organizational knowledge. [9] maintained that over 81 percent of the leading businesses in Europe and the USA report they are actively engaged in knowledge management (KM) activities.

Organizations have always depended on knowledge. Organizations have always relied on innovative ideas and the knowledge of their employers for their competitive advantage. It is often suggested that we live in a new knowledge-intensive period. But an even greater amount seems to be the result of the transformation of all sectors to be more knowledge- than capital-intensive. This has made today's "business models" quite different from yesterday's and, as a result, today's organizations strive to better understand and manage the relationship between what they know and their value delivery. [10] maintains that there has never been a stronger interest in corporate performance management approaches, which uses performance indicators to provide insights into organizational performance.

The improved understanding of value creation can then be used as the basis for strategy creation or assessment, to motivate people to do the right things, and to communicate with external stakeholders. The realization that knowledge is an important factor for organizations and critical to their strategic advantage has given organizations new problems with their performance measurement and management. Human capital consist of the knowledge, skills, abilities, attitudes and experience required to accomplish an organization's mission. It also includes an organization's ability to recruit and retain employees.

### Management

The early 1980s was a period that brought about deep changes in management practices. The competitive pressure of Japanese firms was probably the main reason for an important overhaul. Companies were rapidly losing market share against Japanese competitors. This situation increased the curiosity of western companies for understanding the foundations of Japanese success. Studies carried out showed the need to take into account human factors besides the economic ones; and the importance of superior values that can form a guiding vision for organizations. Excellent organizations present the strengths of innovation, ability to change and a leadership that excel through both their values and their actions. Management needs to be encouraged to take an outward focus and bring about change. Leadership is often associated with solving crisis. [11] argues that the task is not to avert crises but to anticipate and to be ahead of them by creating the "battle-ready" organization which knows how to behave, trust itself and where people trust each other and can work with each other. Managing people consists of more than controlling their activities -management must provide the appropriate leadership in demonstrating its commitment, must foster a culture commensurate with vision and mission, and must make available the funds for the implementation of activities. One of the prime prerequisites for successful implementation for any major initiative within an organization is commitment from the top. It is the responsibilities of the management to establish the strategies towards the objectives of the organization as well as to set priorities to attain its goals. It must be recognized that no matter how noble a cause may be, unless management includes it into its strategic plans and set goals toward its attainment, all efforts which are not sanctioned by management are considered to be distractions from other priorities. Indeed, resources committed to other causes are actually wasted as far as the management of the organization is concerned. Quality management cannot survive in an organization that does not commit to provide management training and time to monitor the ensuing improvement initiatives. There is a strong need to demonstrate leadership through active participation. Successful implementation of organization culture programme must include a recalibration of organization-wide thinking as well as training in quality management and quality assurance methods. Excellence in thinking and high quality work methods are the combined long-term results that are generated by a solid quality management programme. The overall improvements will enable an organization as a whole to become more dynamics responsive, as well as more competitive. In order to ensure success, the basic principles of organization culture must permeate the entire organization. Cooperation, teamwork and partnering are examples that

foster synergy among associates from various functions. Factual approach to decision-making, respect for all individuals, encouragement for innovation, and emphasis on improvement not focus on blame embrace the idea of continuous improvement, the role of management is comprised of two distinct parts: providing the organization with the best crisis management in problem areas, as well as developing a staff that will actively seek opportunities switch-over to another mode of operation where problems are handled without much fanfare, and lessons learned are added to the corporate memory to avoid future repetition.

The Nigerian electric power industry must seek to have the staffs that look for ways of doing things better, that means they must possess a culture that deals effectively with changes. Two fundamental roadblocks for organization culture in the Nigerian electric power industry are the so-called syndrome not invented here; hence not good for us and the old adage, "if it ain't broke, don't fix it" - sometimes stated as "we always did it this way". Organization culture approach is predicted upon seeking ways to do things better hence dealing with change needs to become a way of life within an organization that wants to adopt the philosophy of quality management.

### **Teamwork and Mutual Respect**

These two aspects of dealing with people include many areas within the organizational culture. Grouping the essential cultural issues under these two headings emphasizes the fact that organization culture provides the opportunity to benefit from synergy resulting from various people working toward a common goal. The ability of an organization to turn the diversity among its employees into a complimentary strength is another indicator of the maturity level of its corporate culture programme. Teamwork is predicted upon a clear understanding by each employee of the overall goals and objective of the organization, as well as those pertaining to the specific projects and tasks assigned to that person. Clarity of purpose is essential for the teamwork and avoids priority conflicts and differing goals that are obstacles to harmonious work. Good communication skills and various team-building techniques will enhance interpersonal relationships that are required to accomplish most tasks in a modern workplace. The internal customer concept within corporate culture emphasizes this need to work together: the efficient way for everyone to focus on external customers is, to satisfy the work requirements of each person with whom they deal within the organization and to treat them as links within the chain that leads to the external customer. Mutual respect among employees is the other general aspect of the organizational culture that is paramount in importance for successful implementation of quality management. Fear of ridicule and punishment are two roadblocks for innovation that must be totally absent in corporate culture of any organization that hopes to adopt quality management principles. Mistakes by any employee need to be treated as learning opportunities for every employee.

Corporate culture approach requires that once the situation analysis and measurements have been established, reference guidelines obtained from benchmarking should be consulted. Such comparisons should be internal or external to the organization as a whole to provide a wider scope of comparative data. Improvement projects need to be managed using specific, detailed plans with follow up by appropriate parties to ensure successful implementation, including validation of results compared to expectations.

The approach to both quality and to financial control is to minimize inefficiencies and waste. Management can use corporate culture approach to instill a value-added attitude in employees and to have them review their own operations by them to customers. Using such a value-added approach fits well into the customer-oriented focus of quality management whereby daily priorities and activities throughout the operation are aligned with overall corporate goals to improve operational and maintenance efficiency and current quality and customer service levels.

In the Nigerian electric power stations, hierarchy and fractional tasks (a result of specialization) are still the design logic - a traditional organization. In this approach to organizational design, people are not expected to respond to unpredictable events. [12] points out that it works fine for suitable environments, but is ill-suited in work situations with inherent uncertainties, as in the case with maintenance work: the multiple possible location of a fault, the variability in the extent of damage caused by a failure and the differing windows of opportunities available for disruptive work to be performed on the plant.

Self-managing teams (SMTs), which aim at leveraging and enhancing employee's capabilities are better suited for such uncertain environments. Members in a self-managing team are responsible for executing the task as well as monitoring and controlling their own performance. Each SMT needs to contain sufficient variety to much the range of its work tasks. It also needs the autonomy to adjust and reorganize its internal services, skills and competencies in

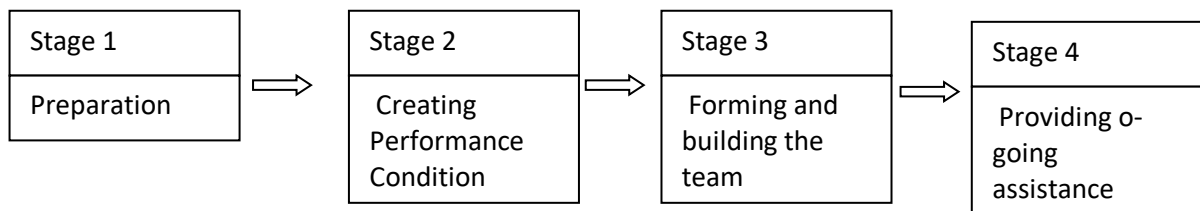


response to changed needs of its work. With these design features, SMTs are immensely flexible and responsive, and members are highly satisfied in doing their work [12].

Sociotechnical systems (STs) concepts provide the theoretical concepts ([13]. The design principles for establishing SMTs as provided:

- i. team activities are task oriented and designed with a strong performance focus;
- ii. the team is organized to perform whole and interrelated tasks;
- iii. the team should have some autonomy (that is, control over many of its own administrative functions such as self-planning, self-evaluation and self-regulation). Furthermore, members should participate in the selection of new team members;
- iv. detailed specifications of tasks, procedures and methods are kept to the minimum. Only those essential for information sharing with outside parties for scheduling or for coordination are established. Within the team, standards are arrived at through agreement on group norms. The flexibility allows the team to evolve and change as members grow and develop, and increase their competence through multi-skilling; and
- v. Multiple skills are valued. This encourage people to adapt to planned changes or occurrence of unanticipated events

Introducing self-managing teams in an existing maintenance organization is a major undertaking with pitfalls. Figure 1 shows a four-stage process for making the transformation.



- |   |  |  |   |
|---|--|--|---|
| <ol style="list-style-type: none"> <li>i. Establishing and analyzing the work to be done</li> <li>ii. Determining the authority the team will have</li> <li>iii. Assessing the cost benefits, and feasibility of using a team to do the work</li> </ol> | <ul style="list-style-type: none"> <li>• Designing the team task</li> <li>• Selecting team members</li> <li>•</li> </ul> | <ul style="list-style-type: none"> <li>• Helping the team establish its boundaries</li> <li>• Legitimizing and assisting with the task re-definition process</li> <li>• Assisting in the development group norms and member roles</li> </ul> | <ul style="list-style-type: none"> <li>• Providing opportunities for the team to renegotiate aspects of its performance situation</li> <li>• Providing assistance as needed to promote positive team synergy</li> <li>• Providing opportunities for the team to learn from its experiences</li> </ul> |
|---|--|--|---|

Figure 1 : Stages of managerial work for creating SMTs

Source : [13]

Self-managing teams do not exist in isolation. A support system must be in place to make them successful.

**Organizational Learning**

It is becoming increasingly apparent that to remain competitive, organizations need a high rate of internal learning that both redefines current practices and adopts new ones. The Nigerian electric power industry is constantly being required to provide a broader range of services faster without extra resources. Achieving "world's best practice" is a common sought goal. Successful organizational learning and knowledge management require inter processes to

support them and a vision that values learning and knowledge. To stimulate learning, data need to be converted to knowledge and couched in the language of the organization. The data must be collected in a meaningful way that is understood and accepted by the people involved and they need to be used to change existing practices in the organization.

External benchmarking programmes are a popular way of identifying such practices, and have the benefit of demonstrating what is realistically achievable. The learning organization in a simple way: 'a group of people continually enhancing their capacity to create what they want to create'. [14] considers this definition too vague, and proposed an extension: "an organization skilled at creating, acquiring, and transforming knowledge, and at modifying its behaviours to reflect new knowledge and insights". Having a vision of what constitutes global competitive performance is essential, but using an internal audit process to identify practices to achieve this performance has significant benefits over simply trying to adapt practices from external sources.

### Learning to Change

There is an emerging debate what organizations should learn and how effective learning takes place and is translated into action. Nevertheless, there is general consensus that organizations need to find better and smarter ways to learn. A learning organization is one which develops and maintains competencies both to perform, and to change the organization to maintain or improve performance [15]. More generally, organizational learning is concerned with improving the behaviour and capability of individuals so that the organization can more effectively respond to its environment. Organizational adaptation and innovation are both critical in a rapidly changing world, could undoubtedly be improved if organizational designers and administrators know more about how organizations learn and about how organizations might be guided to learn more effectively. To be effective in terms of strategy implementation and organization adaptation, need to be systematic, should encourage open discussion of barriers and should develop a partnership among all relevant stakeholders. Systematic change needs to incorporate elements of structure and competences. Individual learning cannot be separated when interventions require alterations in managerial behaviours and values. [16] further claim that strategic change is impeded in organizations by defensive routines and internal politics. Also lack of low levels of competence in critical questioning and acquiring dialogue makes it difficult for organizations to identify underlying causes and to develop systematic solutions. Organizational inertia means firms have difficulty using changes to their organizational routines and behaviours as these embody their knowledge. To reduce barriers and impediments to change, involving stakeholders increases the likelihood of successfully implementing change. Involving commitment and contribution and improves the quality of decisions and the likelihood a decision will be implemented. Meaningful participation reduces uncertainty and its adverse effects, and can increase the climate of trust, enhancing employee's commitment to implementing change.

The concept of learning and knowledge have been around for a while but analysis is at the base of a renewed interest for the concept of "learning organization". Developments are at the base of the importance of organizational learning:

- i. The shifting importance of the factors of production ;
- ii. the accelerating pace of change in the business environment;
- iii. knowledge viewed as a source of competitive advantage;
- iv. customer that are more demanding;
- v. dissatisfaction with the existing management paradigm; and
- vi. the increasing intensity of competition.

Learning needs time and patience, and that it is only the dialectics between thought and action that make it possible. He built his study on the concept of "discipline". Discipline is a body of practice, based on some underlying theory or understanding of the world, which suggests a path of development. Discipline is hard work and there is no end point, but there is an entry point. The five disciplines are: building shared vision, personal mastery, working with mental models, team learning, and system thinking. The five disciplines are basically about values and start as an individual effort based on lifelong learning. The problem is that people associate learning only with classroom programmes and, furthermore, organizations are not ready or willing to develop convenient learning conditions. The first step is to create a learning environment should be new leadership that is based on teaching abilities, and assisting others to Under standing complex situations.

The learning organization also needs some broad organizational conditions in order to develop: a clearly stated purpose, effective communications, training about all aspects of the business, flexible structure and systems, and an organization that facilitates innovations, creativity, and risk taking. Concrete practice and tools should accompany this effort: systematic problem solving, experimentation, learning from past experience, learning from others, transferring knowledge, and measuring learning. [17] points out that any evolution needs the transformation of culture. Three foundations for learning: enduring values, trust and empowerment. Learning should be viewed holistically; in other words, learning is the work of everybody and forms part of the culture. Thus, learning is not regarded as a simple instrument as it is the case in the Nigerian electric power industry.

The importance of knowledge creation where particular skills related to collecting, storing and codifying knowledge for future use are regarded as a competitive advantage of the organization. This can be done by auditing the knowledge generation and use within organizations.

### Competence

Over the past decades, the competence concept has become invaluable for studies designed to illustrate corporations' competitiveness and strategic decision-making.

Competence is defined as the collective learning in the organization, especially how to coordinate diverse production skills and integrate multiple streams of technologies. As a continuous improvement tool, benchmarking is used to improve core competencies, the basic business processes that allow an organization to differentiate itself from its competitors. A corporation's core competencies are those which the corporation can parley into a competitive advantage by deploying them in a special manner [18]. A key feature of core competencies is that their effect can only be "measured" at the level of the customer. If a core competence does not create value for the customer, it will fail to result in any competitive advantage for the organization. The following tests can be used to determine whether a competence is "core" quality or not :

- i. The competence is practically inimitable
- ii. The competence can contribute, across the board, to the sum total of the corporation's product and market combinations; and
- iii. The competence creates value for the corporation's customers.

Core competencies by definition are virtually inimitable. Core competencies differ from an organization's other competencies; the latter are differentiated into either support or complementary competencies. Complementary competencies add value to core competencies; however, they can be imitated. Support competencies, on the other hand, are defined as competencies that are essential for a corporation's competitiveness but not sufficient to bear the corporation's competitiveness banner alone.

Today, industries' management are supposed to protect core competencies - that is, center developmental activities on them and continually ensure that they are difficult to imitate, otherwise, the corporation's core competencies will lapse into supportive competencies.

Importantly, theories connected to the study, of core competencies highlight organizational learning as an integral element to corporate strategy. Thus these theories point up human abilities and expertise as aspects which corporations ought to plot into their competencies, while at the same time attempting to foster a more dynamic corporate viewpoint on competencies in general and on competence development. Four central components in competence are identified [19]:

- ^Q" | hard (technology);

- i. Hard (technology);
- ii. Employees;
- iii. Organizational structure; and
- iv. Culture

Thus, identifying these components and charting their collaborative effects are the key to unlocking competencies. The descriptions of these components emphasize their interdependent nature; accordingly, competencies must be



studied as interconnected systems, to which technology, employees, formal organizational structure and corporate culture all contribute.

The processes by which organizations create and improve organizational competencies have gained increasing attention in the study of organizational learning. Competencies are regarded as the embodiment of learning to do things better and differently. The capabilities and competencies of an organization are what it can do as a result of resources working together. Competencies involve complex patterns of coordination between people, and between people and other resources that lead to differences in sustainable competitive advantage over a long period of time. Learning underpins the creation of competence. It provides quality and consistency, as well as replicability of the action: the actions are the manifestation of the competence, which the learning has created and made possible. Action has to take place overtime, involve improving current performance and making effective change. Industry specific competencies are the organizational competencies. Industry's specific capabilities increases the organization's capability to exploit a new technology suggests that distinctive or core competencies increases the organization's competitive advantage. Effective competition is based less on strategic leaps than on incremental innovation that exploits carefully developed capabilities. Core competences as a set of differentiated skills, complimentary assets, and routines, that provide the basis for an organization's competitive capabilities and sustainable advantage in a particular business.

### Benchmarking

Defining the object of a study of a benchmarking initiative is a first and fundamental step if improvement of maintenance or operational performance intend to boost competitiveness and business results[20]. Therefore, the selection of maintenance or process for benchmarking must be preceded by a diagnostic of the current situation and an analysis of factors of success or top priority dimensions of maintenance and process performance (which in turn depend upon strategic decisions about what market segments and dimensions it wishes to compete and to deliver expected value to customers. Also, since customer expectations are influenced by what competition can offer, analysis of performance against competitors should be considered in order to decide what maintenance or process should be prioritized for benchmarking.

Improvement of a reactive maintenance in the Nigerian electric power stations to proactive, will take some years. The situation is not technically difficult; time is required to change the corporate culture from the present negativity towards the maintenance function to one of treating it as a core business.

Therefore, aligning benchmarking maintenance with the organization-wide improvement needs demands and analysis in which maintenance strategies selected for implementation are those that can most contribute to the efficiency and effectiveness of the business process mostly related to prioritized competitive criteria. That is:

- i. Competitive dimensions are prioritized for improvement based on strategic positioning, customer expectations and performance on such dimensions against competition;
- ii. Priority process for improvement are selected based on the impact of such processes on dimensions taken as improvement priorities as well as on qualitative and/or quantitative diagnostics of performance; and
- iii. Benchmarking maintenance strategies are defined based on the extent of their contribution to leveraging maintenance or process maintenance.

Thus the approach should be very much concerned with identifying dimensions of performance of maintenance and operations, as well as mapping business processes involved in delivering value to customers. Competitive dimensions such as quality, cost, delivery and flexibility can be disaggregated into more focused aspects such as conformity, reliability, availability, speed, dependability, cost of maintenance, flexibility of process, etc. Mapping can also bring the benefit of helping in assessing performance of operational and supporting processes. Assessment of performance is essential to diagnose the root causes of problems or weaknesses so as to determine what to benchmark. Information on process performance can be gathered with qualitative and quantitative analysis of the current situation. Cause and effect diagrams such as the fish-bone diagrams may be used for this purpose.

The Nigerian electric power stations have a volume cap, but persistent downtime has increased costs, preventing them from achieving the desired financial results desired. They have refused to calculate the cost of downtime. They failed to consider the following factors: utility costs, cost of idle production/maintenance/operational personnel, cost

of late delivery (to the customers when in brown or black-out); and overtime costs to make up cost generation to meet schedules.

Several types of benchmarking can be employed in conducting benchmarking project. They include[21] :

**Internal benchmarking.** By comparison of performance of units or departments and organization or set standards within an organization. Comparison can be made of similar, products or services of similar business unit.

**Competitive benchmarking.** By comparison of performance with direct product competition. In this case comparison can be made of product or services and business processes.

**Functional benchmarking.** Specific function comparison with best practice. It is an application of process benchmarking that compares a particular business function in two or more organizations in the same industry.

**Generic benchmarking.** Search for the best practice irrespective of industry. It is similar to *functional benchmarking* but the aim is to compare with the best in class without regard to industry. Table 1 shows the dimensions of maintenance management and key decision

**Table 1: strategic dimensions of maintenance management and key decision**

Dimension	Service delivery options	Organization and work structuring	Maintenance methodology	Support systems
Strategic options	Focus on maintenance as a core competency. Outsource activities which are not part of the company's core competencies	Flatten the hierarchy. Develop a flexible workforce. Maintain a multi-skilled and specialized workforce	Focus on asset-centred maintenance methodology-RCM. Focus on people centred methodology-TPM	Empower the employees. Cultivate teamwork e-maintenance : a CMB, e-CMMS
Key decisions	Activities to be kept in-house. Relationship with external service suppliers. Managing risk of outsourcing	Plant specialization and multi-skilling. Workforce location. Workforce location. Workforce multi-skilling and specialization. Structuring maintenance work. Interface with operations.	RCM : Assets to be covered. Participants involved in analysis and design. Asset maintenance method-RTF, PM, CBM, design improvement. TPM: Scope of application. Redefining the role of operators and the maintainers	Aligning the following practices and support systems with the change programmes participation and autonomy. Hierarchy and communication. Education and training. Reward and recognition. Performance measurement. Management information systems E-maintenance : web-services architecture. Palm computing and wireless technology. Trust management
Key elements of the change processes	Communicating the need for change. Educate employees to acquire new skills and play new roles. Alleviate anxiety of employees. Develop implementation plans. Review progress and take corrective			

	action.			
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Source [21]

Benchmarking use were associated with high levels of both adaptation of best practices and operational performance [22]. They also proposed a relationship model between learning, benchmarking, understanding and performance, in which benchmarking, as a part of learning process of an organization, at the same time promotes a company's understanding of its strengths and weaknesses and higher levels of performance.

### 1.9 Strategic Dimension options

[23] models' maintenance as a transformation process encapsulated in an enterprise system. In the input-out model, the resources deployed to maintenance include labour, materials, spares, tools, information and money. The way maintenance is performed will influence the availability of production facilities, the volume, quantity and cost of production, as well as safety of the enterprise. Since the use of external service providers has always been an option in maintenance decisions, the inputs to the maintenance process should also include these external resources [23]. From the input-output model, four strategic dimensions of maintenance process as listed below can be identified. The first relates to the inputs, the next two are concerned with the design of maintenance process itself, and the fourth one is about support systems: 'V/f Service delivery options: the choice between in-house capability and out sourced service;

- i. Service delivery options: the choice between in-house capability and out sourced service;
- ii. Organization of the maintenance function and the way maintenance tasks are structured;
- iii. Maintenance methodology: the selection of maintenance policies; and
- iv. Design of the infrastructure that supports maintenance.

### Review of Current Maintenance Policies

The modern view of maintenance is that it is all about preserving the functions of the physical assets. In order words, carry out tasks the serve the central purpose of ensuring that plants and equipments are capable of doing what the users want them to do, when they want them to do it. Maintenance actions are dependent on many factors, such as the failure rate of the plants and equipments, the cost associated with downtime, the repair and expected life of the plants and equipments. In order to meet these requirements various maintenance strategies have been evolved. Table 2 shows the types of maintenance programmes

**Table 2: Types of Maintenance Programmes**

Improved Maintenance (IM)	Efforts for the reduction or elimination of the need for maintenance Reliability engineering efforts need to emphasize the need for error elimination rather than maintenance
Corrective Maintenance (CM)	Corrective (emergency, repair, remedial, unscheduled) Troubleshooting and diagnostic fault detection and isolation
Preventive Maintenance (PM)	Maintenance carried out when equipment needs it. Uses human thought process, electronics and sensor technology, to detect if threshold limits of established standards have been exceeded in order to take most appropriate action.
Preventive Maintenance (PM)	Use of statistics and probability theory for data generation and analysis to detect trends in causes of failure and therefore take appropriate measures for prevention
Preventive Maintenance (PM) (scheduled)	Has to be used only if there is an opportunity for reducing failures which cannot be detected in advance. Different from interval inspection which looks for threshold conditions.

Source: [24]

### Current Maintenance Strategies

Apart from condition monitoring and on-condition preventive maintenance industries have struggled to make the choice between other maintenance policies. This has led to the increasing interest within industry in two strategies, which offer a path to long term continuous improvement rather than the quick fix. These are reliability centered maintenance (RCM) and total productive maintenance (TPM).

### RCM

RCM is a maintenance perspective in an operational context - understanding plant goals, needs and equipment (e.g., how equipment serves, ages, and fails), and then developing a maintenance strategy to optimize outcomes in the context of organizational goals. It opens an operation-maintenance in operations. When maintenance is understood and the role quantified in the maintenance, and maintenance operations. When maintenance is understood and the role quantified in the maintenance process and maintenance limitations - where and when to involve design engineering - then the organization will be in a better condition always. RCM brought together many loose maintenance ends under a common umbrella, covering the full maintenance spectrum to identify the range of possible solution. RCM provides a standard common methodology for assessing, banking and evaluating any maintenance environment. RCM provides the structural glue that holds together the three professions of operations, maintenance and engineering. They key RCM points include:

- i. Strategic mission-oriented thinking;
- ii. Systems equipment approach;
- iii. Function understanding;
- iv. Technology assessment;
- v. Fact-based decision processes;
- vi. Failure understanding (especially root cases);
- vii. Continuous improvement;
- viii. Completeness;
- ix. Functional failure analysis;
- x. Risk management orientation;
- xi. Benefit/cost (BC) consideration; and
- xii. Failure modes identification, classification, and study.

RCM helps identify the maintenance repertoire an organisation chooses to support. It can identify weak maintenance processes based on statistical and approximate failure analysis. It greatly increases the operation and maintenance of critical equipment components, and increases their sensitivity of rework processes. Many factors contribute to excellent maintenance performance. Consistency comes from knowing the job, following standard practices, working with close engineering support, and adequate training. These factors need continuous focus to assure maintenance performance is consistence, and constantly improving.

### TPM

TPM is a manufacturing led initiative that encompasses the importance of people, a "can do" and "continuous improvement" philosophy and the importance of production and maintenance staff working together. In essence, TPM tends to liberate an organization to liberate its own potential.

The modern business world is a rapidly changing environment, so the last thing an organization needs if it is to compete in the global marketplace is to get in its own way because of the way in which it approaches the business of looking after its income generating physical assets. So TPM is concerned with the fundamental rethink of business processes to achieve improvements in cost, quality, speed, etc. It encourages radical changes such as:

- i. Flatter organizational structures-fewer managers, empowerment teams;
- ii. Multi-skilled workforce; and
- iii. Rigorous reappraisal of the way things are done-often the goal of simplification.

It also places these changes within a culture of betterment underpinned of continuous by continuous improvement monitored through the use of appropriate measurement.

### Supportive Systems

Strategic initiatives, such as multi-skilling, inter-trade flexibility, outsourcing, RCM, TPM, redesign of work processes and structures, often fail to deliver expected benefits. The main reason for such failures is that values management behaviors are support systems (including information training, performance management and reward systems) that align with these initiatives were not in place when the change programmes were implemented. Effective deployment of information technology in support of maintenance options is also a critical issue.

### Participation and Autonomy

Employee empowerment is a core concept shared by these change programmes, with exception of creating internal commitment, management must involve employees in defining work objectives, specifying how to achieve them and setting stretch targets [21] while autonomy may be a zone concept of empowerment management contains control through information systems, processes and tools - thus, employee participation must be in place for empowerment to take root.

### Hierarchy and Communication

Evolutionary psychology provided insights into human behaviour at work. Some of the finding that relate to hierarchy and communication in organization settings are.

People tend to classify others into in groups and out groups. It explains why some groups, such as maintain and operations, within organization are so difficult to mix, an impediment to communication and organizational learning.

- i. Bad news is heard first and loudest:
- ii. People tend to be risk averse they stay in the comfort zone. They are more willing to take risks when dissatisfied with the status quo.
- iii. Informal communication networks exist throughout the organization and information passes through them rapidly having managers who wander around and ask questions can be an effective way to communication, as long as it is alone a ultimate of trust and openness. Such information practices also have the benefits of sending out positive signals and reinforcing official messages.

Managers in the Nigerian electric power industry should do well to recognize the above innate tendencies when communicating with employees. This is particularly important on sensitive issues such restructuring of work and change. Framing the situation as a basis coming on the horizon (losing competitiveness due to right maintenance costs) and taking steps to address the expected activities of employment (no-lay-off policy) are useful moves to get buy-in for change programmes.

In a culture that stresses participation and autonomy, the function of hierarchy is not control but support decisions on broad based issues, such as implementation of RCM, TPM or introduction of a new reward system, are made after management has entered into dialogue with the affected employees. In their new roles, manages should provide overall direction for the work that is clear and engaging. They also offer hands on coaching and consultation to help employees' relevant knowledge and skills, and to formulate uniquely appropriate performance strategies that generate synergistic process gains. They should also be responsible to requests from employers to ensure that the resources required for performance are available when needed. Every complaint should be considered an opportunity for improvement ideas as managers at Toyotado. Employee empowerment can generate into exploitation if changes throughout that management hierarchy. A strong employee voice is needed to ensure that shop floor concerns are heard at all levels of management.



### Education and training

Empowerment will degenerate to abandonment if employees fail to get the right tool, training or their use in their implementation. Educational resources, which can include technical consultant as well as training, must be available and accessible to employees with identified needs. Operation should be upgraded to operator-maintainer in TPM, However, the training should not be little to technical skills and knowledge needed for optimal task performance. It should also include generic matters like the business imperatives peculiar to the organization (what determines the value of its product and services to customers), problem solving technique, team dynamics and facilitation skill. The additional training for managers communication, coach, resource provider) they should perform in the change programmers and the new management behaviour that will align, organizational goals.

### Reward and Recognition

According to evolutionary psychologist, the desire to mature. Attempts to eliminate status through de-laying or removal of status makers will find new variations spring up in their place instead of working against such human instincts, managers are advised to recognize and reward employees through status recognition in flexible ways. Teamwork should be the norm for getting work done. The culture should be reinforced by promoting employees who teach and help others to team leaders roles. It should be reward exemplary performance, especially in flat organizations. Therefore, fluid forms of recognition may need to be adopted. These should include bonuses, performance responsibilities such as leadership in asystem-commissioning task or a plant refurbishment project. A wide variety of remuneration programmes that takes into length of service are being used in some progressive organizations.

If an organization stresses teamwork, the remuneration structure should promote teamwork rather than undermine it. From a study on two best practice organizations (Fel-pro and Steelcase), The following critical success factors for a reward and recognition system that encourage teamwork:

- i. Top management commitment to teamwork and the concept of team-based reward sand recognition;
- ii. Management is available and viable;
- iii. Employees are regarded as the organizations most available assets'
- iv. Employees value empowerment and involvement as a form of reward and recognition
- v. The organization relieves on structured process, policies, and documentation;
- vi. A strong network is in place vertical, horizontal, diagonal, intra-team and inter-team communication;
- vii. A performance measurement is in place, and employees participation in training.

Cautious that offering employees the "right" reward alone is unlikely to produce sustained employment. The power of such methods wears off with use, creating dependency to maintain commitment. Trust involvement and autonomy are the lasting ingredients that drive human energy and activate the human mind.

### Performance measurement

Performance is measured with reference to clearly defined objectives. Better service and lower maintenance costs can be achieved by engineering the process of delivering maintenance service. Major process innovation in a specific function such as maintenance do not occur continuously. In view of the complication, it becomes common practice to measure individual aspects of maintenance performances. The commonly used maintenance performance indicators can be classified into three categories:

- i. Measures of equipment performance, such as availability, reliability and overall equipment effectiveness;
- ii. Measures of maintenance, such as labour and material costs maintenance; and
- iii. Measures of process performance, such as ratio of planned and unplanned work, schedule compliance;

Typically, these performance indicators are tracked because of the following (Tsang, 2002);

- i. These indicators have been used by the organization in the past
- ii. Some of them are used for benchmarking with other organizations;
- iii. The required data are easy to collect; and

iv. Some of them are mandated by regulations or the corporate office.

These diagnostic measures are used to determine whether the various aspects of maintenance operations remain in control or compare favourably with counterparts elsewhere. Thus, they are used largely to support operational control and benchmarking purposes. Given their retrospective and introspective, these generic measures are inappropriate to provide a holistic assessment of maintenance performance. Furthermore, it does not provide information for predicting the unit's ability to create future value added to support the business success of the organization.

A core feature of the process is the balanced scorecard (BSC) that provides a balanced presentation of strategic performance measures around four perspectives; financial, customer, internal processes, and learning and growth. The BSC is a powerful communication tool for providing a sharp focus on factors that are important to maintenance in making contributions to business success of the company.

It enables holistic assessment of performance and guards against sub-optimization because all the key measures that collectively determine the total performance of maintenance are monitored.

### Corporate Culture, Its Place in An Organization

It may be pertinent to questions such as what is corporate culture? How do we measure it? Can it be changed? Why is it important in the context of maintenance?

In recent years and more attention has been given to corporate culture. Corporate culture however is at the heart of any organizational system. It has history a past and present, and is affected by management systems, people structures, processes and externally by society and the wider environment [25]. Success in business is not determined by the visible features-the strategy structure and reward systems of the organization. Rather the organization itself has an invisible quality a certain style, a character, a way of doing things- that may be more powerful than the dictates of any one person or any formal system. Culture provides meaning, direction and mobilization, a social energy that moves the corporation into either productive action or destruction. "Social energy" seems to be at the heart of corporate culture and conclude that culture is the social energy that drives or fails to drive - the organization. To ignore culture and move on to something else is to assume once again, that formal strategies, structures, and several systems are enough to guide human behavior in an organization - that people believe and commit to what they need or are told to do. On the contrary, most of what goes on in an organization is guided by the cultural qualities of shared meaning, hidden assumptions, and unwritten duties.

The impact of culture on any organization is measured by its thickness (i.e., level of penetration), extent of sharing, clarity of ordering, or by its direction of impact (where is it leading the organization to?), or its pervasiveness (how widely spread and shared amongst members?) and the strength of its impact, (the pressure culture exerts). Two categories of cultures or models of behaviour are presented.

These include:

- i. Transformation dynamics. These represent areas which are mostly influenced by environmental factors (mission, strategy, leadership). These variables shape the corporate culture of the organization; and
- ii. Transactional dynamics: These represent the short term organizational changes. They include such variation such as structure, management practice and systems (policies and procedures).

The difference between transactional and transformational cultures is the unit of time. Transactional change happens all the time and is really a transactional type of culture. These changes can happen overnight and can last for as long as it is necessary or desired by management. The transactional change however is much more different and reflects corporate culture. Usually, it has a long term objective and can take between 3-15 years.

### Transforming Corporate Culture in the Nigerian Electric Power Industry

There are various ways of achieving complete corporate culture transformation in the Nigerian electric power sector. The first important task for leaders is to make maintenance culture of the power stations explicit through a cultural audit". This task needs to be directed by the senior managers who are directing the stations to identify the

shared values, beliefs and discard those which are no longer valid. Culture audit can include areas such as beliefs about goals, distinctive competences, product-market guidelines, management employees (Together with a strategic review process, a cultural audit can serve the basic for conducting incremental and radical transformation. It is vital that long range planning is considered in parallel to corporate culture.

It has been argued that long range planning offers the (disclosing problems and thus creating of unfreezing (disclosing problems and thus creating a sense of crisis); change (the planning process should be the ongoing exercise and as such faces management to consider constantly the various organizational factors which affects performance); refreeze (long planning is a formal, authorized plan which has to be implemented as agreed, the culture transformation should lead to a dynamic process which can adapt to different environmental conditions and where a high degree of flexibility can allow the power station to modify and change their characteristics plans. Long range planning can only become effective if the power stations corporate culture state dynamically evolves to encompass the necessary requirements for strategic plans to succeed. The culture audit and strategic review exercises determine which approach needs to be adopted for achieving the necessary changes.

To be effective, a continuous improvement process need to delivered through rapid resolution of problems which represent a concrete improvement activity with problem alternatively being referred to as improvement opportunity. Various proposals have been put forward to explain what needs to be done to change the approach to continuous improvements:

- i. use of critical thinking skills for effective - solving: the wealth of specialized knowledge in any business is far more important than technological sophisticated innovation. More emphasis needs to be placed on people;
- ii. continuous improvements is not a standard management. Practice: Continuous improvement required critical thinking and management technology such as statistical process control (SPC);
- iii. the customer is next in the chain: customer feedback and input should not be regarded as a necessary evil but more as an opportunity for conducting improvement; and create a management system which will consider continuous improvement as a never-ending activity.

The following suggestion are necessary:

- i. to improve all processes, we must know about the work at all levels. We use our knowledge and understanding of these work processes to find the problems, error, complexities and waste, and get rid of them;
- ii. the company must improve internal and external processes, seeking to measure and improve quality with a customer focus; and
- iii. customers define quality, and we continuously improve our processes to give them the quality services and products they require.

Total Optimization: using people's skills and knowledge so that they are no longer confined to a localized area but geared towards a total goal oriented organization optimization can be achieved by providing people with the necessary tools and direction, by creating a supportive environment and by sharing results with everyone concerned: continuous improvement comes only when individuals are motivated to achieve regular improvement in all areas of their work. It is acceptance of the reality that people are their brain children- like their own children - require years of patient nourishing before they become important, but equally important is what we do in the years after the new machine or process or system in place. With continuous improvement approach, the benefit of a major set in technology is multiplied by the many small steps that follow. And what holds true whether your dealing with improvement in quality, maintenance, productivity, financial systems is human development.

Continuous improvement means that efforts have to be sustained, Kaizen in Japan means ongoing which involves everyone in the organization. Kaizen affects all layers of management and workers. The concept is made easily applicable because there is wide recognition that problems all existing everywhere in the organizations that those need to be tackled if companies are to progress. Continuous improvement is usually represented in terms of Kaizen and innovation Kafzen however, is a reflection of cumulative positive efforts which that organizations competitiveness is positively progressed. Karzen is a people-oriented approach to competitiveness whist innovation is a technology-oriented approach to competitiveness.

## Conclusion

The electric power industry in Nigeria is under increasing pressure to improve reliability availability and reduce cost of power supply as the industry is bound to face stiff competition due to new competition in the deregulation. This, the industry has to recognize, and should respond by focusing on customer needs and satisfaction, hence should focus on continuous improvement and resolution of customer problems. This study has researched on barriers to continuous improvement and lack of corporate culture in the Nigeria electric power industry. There are basically six areas that hinder improvements: leadership; training, communication; motivation; teamwork; and the management of change. The business have been addressed by reviewing the literature and making a number of recommendations for the organizations composite culture and management style, target setting methods and change management.

The management practices in the Nigeria electric power industry can be translated in a variety of ways such as for example, establishing a culture which treats problems as opportunities and encouraging people than blaming people. Fear removal and encouraging people to admit problems freely are important management tasks. In addition, the management systems should place a lot of emphasis on collaboration, team effort and interventional activity. Reward systems are for overall effort rather than individual results. People should be encourage to own the processes they operate and control on an everyday basis and they should be given modern tools and turned on new techniques to make improvement an easier target to achieve. The need for continuous improvement, organizational learning and performance measurement is that standards tend to deteriorate, technology tends to be superseded, and market requirements change thus limiting flexibility of innovation. TPM and RCM as well as total quality management (TQM) seem to be the ideal opportunity for the Nigerian electric industry to tackle the various obstacles to implementing continuous improvement based on a blend of Kaizeih and innovation. It should be recognized that the following elements are essential if the Nigerian electric power industry is to have any continuous improvement initiative to succeed. The following are needed:

- i. continuous improvement - a customer driven effort. Targets can only be set and determined by customer requirements;
- ii. the use of knowledge work is required - any continuous improvement initiative will depend on peoples skills, knowledge, expertise and reactive output;
- iii. continuous improvements is about international problem solving activity and teamwork. Shared goals and objectives are the key to successful continuous improvement;
- iv. continuous improvement should focus on the whole process (means and the ends) rather than the results only;
- v. improvement should be slow and gradual business rather than short term profitability;
- vi. continuous improvement requires positive management systems which create a positive climate for improvement and supportive management teams;
- vii. management systems should include the use of tools and techniques to understand processes, measure existing performance, identify problems and implement the solutions; and continuous improvement has to be based on Deming PDCA cycle:

Plan-commit to plan and impellent change intended to meet customer requirement in a better way; do-communicate effectively through teamwork and better employee involvement; check-investigate processes using analytical tools and techniques to eliminate waste and streamline operations through planned actions and a commitment to improvement of the process and output is achieved.

The roles of leaders in the power stations is essential. The leaders have to be more of facilitators and decision makers than problem solvers. The leaders are expected to be good and effective communicators. The leaders should be good at time and change management, they must take good care of people they are in-charge of, must provide vision for the power station they are in charge of, must be highly visible and approachable, must be firm and effective in their decision-making, reliable, open-minded and exude integrity. Their involvements should be in the planning, implementation, measurement and championing of the whole effort so that it becomes a never ending quest for improvement and progress.

Once a corporate culture of common beliefs, principles, objectives and concern has been established, maintenance and operations will manage their own tasks and will take voluntary responsibility to improve processes which they own.

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