Modeling of Effective Maintenance Function for Manufacturing Excellence Program: A Case of Manufacturing Industry, Sri Lanka

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ABSTRACT

Improvements in the productivity ensure the existence of the industry whatever the competition is there. The program called as Manufacturing Excellence has become the most updated version of productivity improvement strategy and is converting the traditional environment into a lean manufacturing environment. In the context of Manufacturing Excellence as a productivity improvement strategy, it provides a fine tune for all the processes, people, goods and information within the work floor. Though there are number of organizations keeping touch with the productivity techniques, the success of them have not been really achieved. According to the findings, it has clearly recognized that the failures of these attempts are due to the unidentified proper maintenance function. An effective maintenance management can interfere in improving the productivity concerning the basic and the effective maintenance practices such as planning jobs in advance, coordinating the tasks in an effective manner, good leadership, healthy operational involvement, establishing a better communication system in the work floor and involving with preventive and predictive maintenance practices etc. This study is an attempt of investigating the proper maintenance function to assure its sustainability which is composed of effective maintenance practices and finding the relationship between the maintenance practices and the productivity improvement strategy by collecting the data from a selected organization.

KEY WORDS: Maintenance Practices, Maintenance Function, Productivity Improvement

INTRODUCTION

Thousands of expectations of the customers raise their endless demand for high quality products which is of paramount importance so that the manufacturing industry today is enforcing their services to successfully challenge this situation. By converting the available resources into profitable goods and services, the manufacturing industry is always searching for productivity improvements updating their strategies like Kaizen, 5S and Six Sigma etc suitably fitting with the innovations. Covering up all these productivity strategies which are moving out from the day, Manufacturing Excellence program has been able to minimize the waste which brings a great adversarial upshot to the manufacturing industry.

Both in research and practices, the role of maintenance have become pioneered in the field with an intension of successfully continuing the process. According to the previous researchers, the productivity techniques have been affected by the performance of the shop floor workers and their maintenance practices established by the maintenance management. In response, the maintenance function needs to manage its targets optimizing the performance of the workers correspondently with the available resources.

In order to successfully meet with business profit margin satisfying the existing demand, the shop floor workers have to be in line with new production strategies. Through that, the manufacturing industry will be able to achieve the best performance level; hence it is important to do researching the proper maintenance function of such a new productivity improvement strategy to assure a better existence of it in industrial context.

Problem Definition:

The maintenance function is the base of assuring the existence of any productivity

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technique whereby putting the place of the effective activities in the work floor. Therefore a proper maintenance function should be identified in order to successfully achieve the best outcome of the productivity technique and its further existence.

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For an example, though Six Sigma aims to improve the performance by reducing variations there are poor practices that commonly lead to the failure of the technique. Lack of commitment of leadership, assignment of Black Belt roles as part time jobs, bad alignment to organizational objectives and lack of rewarding systems and no any recognition mechanism within the organizations etc are some of those ineffective maintenance practices which should be properly identified (Jacowski, 2008).

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Though there were several productivity techniques implemented earlier in the particular manufacturing organization, it could not come up with a sustainable technique. The problem intended for this research is that no any proper maintenance function has been identified with related to any of productivity technique implemented earlier there because the organization is just in the habit of following the basic of the procedures instead of thinking its further existence by having a proper maintenance function. Therefore if this organization can identify the effective maintenance practices, they will be able to get the maximum use of this new productivity strategy.

The attempt of this research is to build of effective components of such a maintenance function for an effective implementation of Manufacturing Excellence Program.

The statement of this research problem can be narrowed down as follows:

Still the selected organization has not clearly identified the effective maintenance practices that lead toward the sustainability of new productivity improvement strategy.

RATIONALE OF PROPOSED RESEARCH STUDY

a) There are few number of researchers completed their researches finding the maintenance function for a new productivity technique.
b) It is very important to identify the effective maintenance practices that can be followed by the workers within the working environment.
c) Finding out a proper maintenance function will lead Manufacturing Excellence Program for its sustainability in industry.
d) It will clearly guide the workers to enhance their performance by identifying the effective practices minimizing their work load weighted with ineffective practices.

These major points will give fine evidences to rationalize this research objective.

RESEARCH OBJECTIVE

The main objective is to investigate the proper maintenance function for Manufacturing Excellence Program by identifying the effective maintenance practices which lead to the sustainability of the strategy.

LITERATURE REVIEW

The new productivity improvement strategies are the outcome of past researches which have concluded the fine witnesses for improvements in the productivity of any organization. There is a positive effect of new production technologies for the success of an organization (Dean and Snell, 1991). This has further motivated the researchers to do researching with related to new production technologies.

Manufacturing Excellence Program

The program of Manufacturing Excellence is a fine example which is focused on stabilizing the production processes, people and the asset of the organization and

increasing the expectations of customers for high quality products in order to retain whatever the competitive advantage that they have. This is an Indian origin program which includes 5S, Kaizen and Six Sigma. By dividing Six Sigma into different stages, this program is followed by its strategy. The output is measured in relation to the productivity of organization. The concept of this program is very practical and an imperative tool for an organization to embrace innovative ideas and processes. Manufacturing Excellence Program continuously supports to the organizations in creating of a competitive and lean organization.

This program was reinforced during the recent economic slowdown that required companies to supply products and services at competitive prices without affecting quality and delivery standards to sustain their market presence ensuring consistency and quality. So that Sri Lankan manufacturing industry is today in the attempt of getting involved with this valuable program indeed remaining competitive in the market and sustain growth with an intension of enhancing and upgrading the skills of the employees equipped with a proper training and experience.

Maintenance Function and its Response

Maintenance is the key to the sustainability of any system. In order to achieve the better performance of any strategy, it is very important to identify its maintenance function which further describes the effective practices that should be followed by the workers of any work floor. An excellent practice of maintenance management is really needed to increase the life cycle of the property and to minimize unexpected breakdowns or deterioration effects (Emma, 2009). So that the maintenance function will smoothen the processes and flow of the work floor by finely providing the solutions for the matters arising in manufacturing environment.

Sustainability is never achievable where the poor maintenance is present of any productivity technique. That is definite. The firms are only worrying on the impact on the direct labour instead of considering the major changes that they require for further existence of the new technologies within the work floor (Ward, 1992). Therefore identification of the most effective practices enforces the workers to adapt with work assuring the future existence of such a productivity improvement strategy.

The number of new demands are placed on the maintenance function hence those new demands will lead to changes in the traditional views and practices associated with the maintenance practices. As a result, the maintenance function reacts to create a lean environment with less amount of wastage.

For a better foundation of maintenance, the following maintenance practices are to be selected for further analysis.

Communication and Coordination
Leadership
Operational Involvement
Equipment Failure Responses
Work Flow
Preventive Maintenance
Predictive Maintenance
Team Working

Among them several maintenance practices may give a higher contribution for the success of Manufacturing Excellence while some of them are not giving a considerable amount of contribution so that the effective practices can be factorized as the components of the maintenance function of this productivity improvement strategy.

RESEARCH METHODOLOGY

Research Design

In order of achieving the objective of this research a deductive approach will be used by analyzing the available data in a statistical way. The selected maintenance practices will be considered as the variables

and they are limited within the production department.

Collection of Data

The responses will be derived through a survey based methodology which is followed by a self structured questionnaire as the research instrument.

Sampling

The technique of random sampling will be used in order to decide the sample representing the population of this research with 50 bodies from the work floor that is figured by the production department of the selected organization.

Category of Data

- The primary data will be collected through a standardized questionnaire which gives qualitative responses.
- Whenever it requires the data in deep, interviewing is to be conducted with relevant industrial expertise.

Data Analysis

Factor analysis will be used to extract the effective maintenance practices which form a proper maintenance function for the new productivity improvement strategy. The descriptive statistics of the data will be used to identify the basic characteristics of the sample.

Expected Outcomes:

- Identifying of maintenance practices influencing effective implementation of Manufacturing Excellence Program
- Improved performance of the workers

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