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Review Paper on Productivity Improvement in Manufacturing Industries by Using TQM Tools

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ABSTRACT: The work has been carried out for productivity improvement in manufacturing industries by using Total Quality management tools. It also increases management skills. In this work TQM tools reduces the minimum input material requirement to maximum desired output which increases the manufacturing quality & productivity. In this project using of TQM Tools productivity of organization is improved and upgrades the knowledge of skilled workers and give training to the unskilled workers. The basic plans used to increase the productivity of industry by TQM analyzing data. The productivity is reduced due to the lack of planning management and collection of data analysis.

KEYWORDS: TQM Tools, Productivity, Efficiency, Effectiveness, Training, Plan.

I. INTRODUCTION

Implementation of TQM tools are used in finding the maximum OEE. The collection of data is important for the manufacturing process result into useful information for productivity improvement. When higher productivity is expected machine tool which are converted into a finished product with the help of raw material to increase the OEE. The reliability includes availability of machines with least down time which requires failure data analysis and root cause analysis. Total quality management consists of organization-wide efforts to "install and make permanent climate where employees continuously improve their ability to provide on demand products and services that customers will find of particular value. Total emphasizes that departments in addition to production (for example sales and marketing, accounting and finance, engineering and design) are obligated to improve their operations; "management" emphasizes that executives are obligated to actively manage quality through funding, training, staffing, and goal setting. While there is no widely agreed-upon approach, TQM efforts typically draw heavily on the previously developed tools and techniques of quality control.

II. CHARACTERSTICS OF TQM

TQM Starts from Top Management: The quality concept is initiated by the top management. The whole credit of the initiation of total quality management goes to the top management. Only the top management can create an environment that develops team-oriented environment and creates quality oriented culture that can prevent problems and continually improve.

It is a Consistent Process: To produce quality product and service is not an easy job. Sometimes it takes years to give the desired results. All the employees have to work consistently as a team in one direction to improve all the processes in the organization.

It is a Part of Strategic Planning and Thinking: TQM policy is a long term planning. The quality policy must be the part of strategic planning to get the desired results.

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It is Customer Focused or Oriented: The end result of TQM is complete satisfaction of customers by giving them quality products and services. It is possible only when TQM programme is customer centric.

It is a Team Work: Success in terms of standard quality is possible only when the organization has a culture of team formation and the employees work in teams and gives their maximum. Teams can be formed vertically and horizontally. When top management is involving the lower level employees it is vertically and when the different departmental employees are involved then it is horizontally (employees of marketing, sales, production and finance departments are working for critical and complex projects). Teams are inter-organizational when the employees of other organizations are involved (like employees of banks, suppliers, audit companies, consultants etc).

It is related with Consistent Improvement of Quality: To deliver quality products and services is not an easy job. All the processes have to be developed and standardized by consistent improvement.

Every Employee is Involved in Quality Improvement Aspect: All the employees internal as well as external are involved in the TQM programme. Internal employees include all the employees included from top to bottom and external employees are suppliers, banks and other institutions which are involved in the TQM process.

Every Employee is Responsible for the Success of TQM: If all the employees are determined and committed for the quality products and services, then only quality could be delivered.

III. PROBLEM STATEMENT

The main problem of TQM tools in manufacturing industry is collecting data without error. In this work it is found that these tools have the significant roles to monitor, obtain, and analyze data for detecting and solving the problems of manufacturing industry, in order to facilitate the achievement of performance excellence in the industry.

BOTTLENECK ANALYSIS: A Bottleneck is a phenomenon, to understand imbalances within a process which cause delays, inventory build up's, process stoppages. It can be relatively easy to identify a consistent point constraint within a process. The performance or capacity of an entire system is limited by a single or limited number of components or resources. In engineering, a bottleneck is a phenomenon by which the performance or capacity of an entire system is severely limited by TQM tools. A bottleneck in total quality management is one process in a chain of processes, such that increasing the productivity of the industries by understands imbalances within process.

IV. LITERATURE REVIEW

Ron Kenett,^[1] In quality management, also referred to as total quality management is considered a major breakthrough in management thinking that significantly contributed to the rebuilding of the post-World War II Japanese industry and the mid 1980's US efforts to regain competitiveness in industry and services. Its foundations include statistical and system thinking, where organizational activities are managed and improved from a process perspective with the involvement of the workforce, suppliers, customers. It is mostly an evidence-based approach where data is used to measure and analyze processes and track improvements.

Richard T. Symons, et.al,^[2] Although there have been many cases of total quality management (TQM) success, embracing TQM does not always lead to performance improvements. Many companies resist the changes in organizational processes such as compensation and performance appraisal systems that are required to link TQM efforts to bottom-line performance. We present the basic structure of a TQM-based compensation system that can provide incentives based on a variety of performance measures, including an explicit incentive for the reduction of variability in product variables. As a result, this approach encourages the continuous improvement central to the TQM philosophy, rather than serving as a disincentive for such improvement as do many traditional compensation systems. The set of performance measures can be adjusted periodically to focus on those measures deemed most likely to yield significant

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increases in customer satisfaction, further supporting the core elements of TQM. The approach is described using examples from the paper manufacturing operation where it has been successfully implemented. A longitudinal analysis of several performance measures is used to demonstrate the effectiveness of the new compensation system.

Ken Stephens,^[3] In this work philosophies of the quality discipline have been and are being established over a large period of our history by many contributors. How the profession defines “quality” has much to contribute to its fundamental philosophies. A comprehensive definition, suitable to the broad range of quality’s involvement, is used in this paper to expose many of its philosophies.

Mary J. Benner et.al,^[4] Organization and strategy research has stressed the need for organizations to simultaneously exploit existing capabilities while developing new ones. Yet this increasingly crucial challenge has been accompanied by an ongoing wave of managerial activity and institutional pressures for process management and control. We argue that these pressures stunt a firm’s dynamic capabilities. We develop a contingency view of process management’s influence on both technological innovation as well as organizational adaptation. We argue that while process management activities are beneficial for organizations in stable contexts, they are fundamentally inconsistent with all but incremental innovation and change. We argue that process management activities must be buffered from exploratory activities. As dynamic capabilities are rooted in both exploitative and exploratory activities, ambidextrous organizational forms provide the complex contexts for these inconsistent processes to co-exist.

Michael E. Milakovich,^[5] The failure of government productivity efforts to improve the quality of public service has prompted calls for the complete overhaul of management procedures. Increasingly elected and appointed officials recognize that productivity enhancement efforts alone do not lead to improved service quality. Past government efforts have proven to be ineffective in motivating employees to continually improve quality. Total quality management (TQM) is a theory based options that allows public managers to reward truly exceptional individual performance yet increase the capacity for agency wide cooperation and process improvement the current interest in applying TQM techniques to public services provides a promising model for launching a total quality management improvement strategy for the American public sector at all levels this article examines the origins of TQM describes how the philosophies of leading quality theorists apply to the public sectors suggests ways to overcome barriers to implementation and presents a brief overview of current federal government total quality improvement efforts.

Ananth Iyer et.al,^[6] In this work the study of linkages between firm level quality initiatives such as quality management systems (QMS) & total quality management (TQM) and output productivity in the Indian auto component industry we use externally validated quality certification and quality awards as proxies for QMS and TQM, respectively as it is difficult to directly measure the QMS and TQM efforts of firms. We use an unbalanced panel of 220 firms and a balanced panel of 73 firms from the Indian auto component industry over the period 1993-2006 to study these links. Both parametric as well as non-parametric approaches are used as appropriate to measure the rate of change in productivity and the impact of quality initiatives on productivity change during this period. We determine the proportion of productivity resulting from technical change and relative efficiency change thus proceeding insights into the structure of productivity improvements we find that TQM efforts resulted in a high rated of productivity change (11%) in the award-winning firms after the award. On the other hand precertification productivity change due to QMS was 5% and post certification change was 3.6% in the periods prior to certification productivity change was driven mainly by technical change whereas the source of productivity change after certification is mixed however prior to awards productivity change was driven mainly by relative efficiency change whereas post award productivity change was due to technical change. The results suggest that management focus on attaining certification did generate conceptual learning linked to technical change during the period leading to certification but these effects were not significant after certification the results also suggest that the TQM programs generated significant productivity gains in the long run although setting the associated systems in place did not result in significant productivity change prior to winning awards thus the study provides direct but nuanced evidence linking quality certification as well as the adoption

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of TQM programs to the associated conceptual and operational learning processes and their impact on the change in productivity.

Doreen R. Schatzberg,^[7] The acquisition of a new systems operation s and maintenance offered an opportunity to apply different methods in the university of Wisconsin extension maintenance organization total quality management (TQM) methods were chosen because they support broader objectives deemed beneficial to maintenance operations. TQM methods focus on the customer are implemented through teams and use data to make decisions rather than relying on inferences or assumptions. The team analyses assess and continually improve the process of maintenance to ensure the product meets customer needs and answer root cause problems this paper describes the team planning implementation and validation efforts accomplished and the finding from the pilot project. In addition to this report on the pilot project this paper includes several reasons why TQM methods may be particularly amenable to software maintenance functions they are:

1. The inherent customers focus on maintenance activities
2. The advantages of team work for gaining consensus on improvements thereby potentially limiting rework
3. The data-based task sequenced structured analytic techniques used in TQM.

Unresolved issues in applying TQM in maintenance organizations include the definition of customer versus user the need to manage customer expectations and the application for use in service organization of techniques honed in manufacturing organizations this paper is a first step in addressing some of these issues. It provides model for applying TQM methods in maintenance organizations.

Feningappiahfred.^[8] Quality has become one of the most important competitive strategic weapons and many organizations have realized that it is a key to developing products and services that support continuing success. Total Quality Management (TQM) is a management system that takes into consideration all the areas of the operations in an organization. Quality systems are designed to set a clear direction for organizations to follow, enabling understanding and involvement of employees towards a common goal. The aim of business is long-term profitability and earnings are achieved by satisfying customers while keeping production cost at a minimum. Total quality management (TQM) is a popular management philosophy and practice designed to enhance productivity and quality, reduces waste, and increase customer satisfaction (Powell 1995). There are four major core concepts of TQM that should be well understood. These core concepts are continuous improvement, customer orientation, defect prevention and universal responsibility. TQM tools help organizations to identify, analyze and assess qualitative and quantitative data which are relevant to their business. These tools can identify procedures, ideas, statistics, cause and effect concerns and other issues relevant to their organizations. Each of the tools can be examined and used to enhance the effectiveness, efficiency, standardization and overall quality of procedures, products or work environment.

MADAR Anca^[9] Total Quality Management (TQM) has an important role in any company, since the implementation of this program companies can continuously improve their performance. Thus, organizations will be able to considerably meet their internal and external clients' needs in terms of services and products quality, and they will also be able to develop an efficient and profitable business. The paper analyzes how this concept was implemented by the British Airways airline, since it is among the first companies that have implemented such a program.

Hoang Thai Dinh^[10] A comparative study on the relationship between implementing total quality management (TQM) and organizational characteristics (size, type of industry, type of ownership, and degree of innovation) in a newly industrialized country in South East Asia. Vietnam has become the 150th member of the World Trade Organization (WTO) since January 2007, and this is the first empirical study to examine TQM practices in Vietnam. Analysis through Structural Equation Modeling, t-test and MANOVA of survey data from 222 manufacturing and service companies produced three major findings. First, this study supports previous research findings that TQM can be considered as set of practices. Second, industries in Vietnam have deployed certain TQM practices (customer focus and

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top management commitment) at much higher levels than others, namely information and analysis system, education and training, employee empowerment, and process management. Finally, MANOVA shows a clear difference in TQM practices by company size, industry type, and degree of innovation. Large companies had higher Implementation levels across almost all practices except for teamwork and open organization when compared to small- and medium-sized companies. TQM practices were statistically more significant in manufacturing companies compared to service companies, and firms having a higher degree of innovation also showed higher levels of TQM practice implementation. In particular, the low deployment of TQM practices in service industries, where TQM has been considered as order qualifier, highlights the challenges for Vietnam's service industries that pursue TQM to successfully compete in the global marketplace.

V. CONCLUSION

The report "Productivity improvement in manufacturing industries by using TQM Tools" which has been concluded by comparison of data. This work is going to identified problem issues within manufacturing business process outsourcing industries. These all seven above mentioned total quality control tools is to be considered and used by management for identifying and solving quality problems during producing the products and services. This work found that these tools have the significant roles to monitor, obtain, and analyze data for detecting and solving the problems of production processes, in order to facilitate the achievement of performance excellence in the organizations. Thus, the productivity of manufacturing industries can be improved by using TQM Tools.

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