A STUDY ABOUT IMPACT OF QUALITY CIRCLE ACTIVITIES ON INNOVATION AND COST REDUCTION IN MANUFACTURING COMPANIES

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ABSTRACT

The world of business is changing with multiple resources to establish them in globalized market. It gave rise to change in structure of Indian companies. This new era seeks support from technical and human resources. There are numerous systems available to update the technical resources but to get human support, organization were forced to involve employee in organization decision making process and this can be successfully implemented through quality circle activities. The purpose of this study is to know the influence of quality circle activities on cost reduction and innovation in manufacturing companies. To proceed with the study, standard questionnaire was designed and data collected from members of quality circle in eighteen manufacturing companies' .The data were analyzed through Pearson correlation and regression analysis. Results emerging from the analysis show that innovation and cost reduction are having significant and positive relationship with quality circle activities. Finally the article furnishes few implications to progress quality circle activities, innovation and cost reduction.

Keywords: Quality circle activities, innovation, cost reduction, globalization\ and Manufacturing companies.

INTRODUCTION

The world of business is changing with multiple resources to establish them as the paramount in aggressive period. No individuals can achieve this aggressive era independently, so they need the support of technology and human resources. There are numerous systems to operate technology, but the issue is effective utilization of human resources and it is also considered as valuable asset in business to attain competition. Human resources can be effectively utilized through participative management. The quality circle is based on concepts of participative management and Humanistic management. Humanistic management refers to management that gives importance to people and their feelings. This is because people are the most valuable asset of a department. Quality circle is therefore a mechanism whereby workers are able to participate in the problem solving process leading to improvement of quality, cost reduction, innovation and productivity in their organisation. Cost reduction means conducting some innovations in the way of working in a new style, so that the excess costs of production and operation could be eliminated. **Axtell et al. (2000)** defines innovation as "The process involves the generation, adoption, implementation, and incorporation of new ideas and practices".

There are many studies related to impact of quality circle and this study specifically tries to identify personal benefits of organization through practice of quality circle in manufacturing companies. Though organizations have many benefits through practice of QCs, the researcher has identified innovation and cost

reduction as most important benefits. Further, the researcher made an attempt to test their relationship with quality circle activities in manufacturing companies.

REVIEW OF LITERATURE

Before exploring the relationship between quality circle activities, innovation and cost reduction brief review related to these variables were arranged in order.

Quality circle activities

Anshita Tyagi.,(2012) Quality Circle (QC) proponents suggest a wide array of positive results when this Participation technique is used either in industry or in service sector. This study is to determine whether QCs in one sector are performing more effectively than the other. It argues that the concept encourages employee participation as well as promotes teamwork and motivates people to contribute towards organizational effectiveness through group processes. Paper concludes that if concept is appropriately implemented in the field of any industry the result and conclusions outcomes will not only be amazing but it will also help us to stumble on out tide over our own lacunae and facilitate designing of a better system.

Subbulakshmi et.al (2015) Result of the analysis reveals that there is positive correlation among QC activities and selected individual variables. It also indicates that 33 percent variations in QC activities have been influenced by participation in decision making, job satisfaction and commitment. Finally the result shows that quality circle activities have greater impact among members of QCs in manufacturing companies.

Innovation

Daniel I. Prajogo (2006) has revealed in his study that there is no significant difference between manufacturing and service firms in both product and process innovation performance. It also indicated that strong correlation existed between innovation and business performance.

Ken Kitazawa (2012) the research analysed the organisational factors of creating innovation focusing on quality control circle (QCC) based on literature-based analysis, interviews and quantitative analysis. The result of analysis have revealed that terms of members' diversity and motivation across-organisational QCC's activities have created innovations through promoting effective

Cost reduction

Santana and Massarani (2000) have revealed that the product design should be defined based on the functions it should perform and not based on its components. To maximize the final result to be obtained by a given product, engineers should start from the function diagnosis and study alternative ways to perform them. This can be done through the resolution of a functional problem, the implementation of cost reductions or the improvement of the product performance.

P.K. Malik (2013) Quality Control Circles was the name that the Japanese first of all used for “Quality Circles” in fifties and sixties. Their major concern was to improve product quality and change their past image as producers of shoddy and cheap goods. With this objective in mind, they started massive training in Quality Control to all sections of employees. It is in this context that they started small group activities which they called “Quality Control Circles.” But as the time passed it was realized that such groups not only improve quality of goods and services but also achieve better productivity, cost reduction, improved safety, etc. apart from humanizing activities and bringing about attitudinal changes and greater cohesion.

RESEARCH METHODOLOGY

Objectives of the study

- To determine the relationship between quality circle activities, innovation and cost reduction in manufacturing companies
- To study the impact of quality circle activities on innovation and cost reduction of manufacturing companies.

Hypothesis

- There is no positive relationship between quality circle activities and innovation
- Quality circle activities have no significant relationship on innovation and cost reduction.

Sampling technique: The researcher has chosen convenience sampling technique, since it is easiest technique to reach the population.

Sampling size: Two hundred and ten members of quality circle from eighteen manufacturing companies have chosen for this study.

Data collection: The data are collected from both primary and secondary sources. Primary data are collected through standard questionnaire and the secondary data is collected from books, magazines, and websites etc.

Research instruments: Three variables quality circle activities, innovation and productivity have been used by the researcher. To measure quality circles activities questionnaire framed of Lee l.Shaw (1988) were used. To measure innovation questionnaire developed by Rogers, Milesand Biggs (1980) were used.

Statistical tools: Multiple Regression analysis and correlations have been used to test the raised hypothesis

RESULT AND DISCUSSION

This section will emphasize and examine about the results and finding of the study. The purpose of this study is to determine the impact of quality circle activities on innovation and cost reduction in manufacturing companies. Results emerging from analysis show that there are significant influence of QC activities on innovation and cost reduction. The following table and its result will reveal the relationship between selected variables.

Demographic variables

For this study data were collected from members of quality circles in manufacturing companies, initially in this data analysis, 80.5 percent of the population are male and 25.7 percent of members are in the age group of 26 to 35years.41.4 percent members are graduates and 34.8 percent members are working as managers. 46.2 percent members are from production department and 33.8 percent members are having more than 15 years of experience.

TABLE-1: DESCRIPTIVE STATISTICS FOR QC ACTIVITIES, INNOVATION AND COST REDUCTION

Variable	Low level		Moderate level		High level		Mean	S.D
	N	%	N	%	N	%		
Quality circle activities	5	11.9	156	74.3	29	13.8	26.17	3.28
Innovation	9	4	162	77	39	19	14.37	2.04
Cost reduction	38	18	108	52	64	30	6.56	2.06

The table 1 explains about descriptive statistics of selected variables from the result it is represented that 74.3 percent of the members accept that moderate level quality circle activities is practised in their organisation. Since performance of quality circle and management support are moderate quality activities of organisation is also moderate. When there is improvement in performance and management support for quality circle, the activities of quality circle will be improved consistently. Many research have Revealed that first top-management support is the biggest single factor in helping to ensure the success of quality circles. Second education and training in quality-circle techniques are also important. Third point to remember is Creating awareness among management and employees of the organizational is considered importance of quality circles to success. The previous research also reveals that quality circles can boost employees' sense of self-worth. Which is important in describes the successful adoption and implementation of quality circles in a manufacturing firm.. And 77 percent moderately accepts that there is innovation in their way of thinking towards organisation growth From the table it is clear that 52 percent of members accept that cost reduction occurs moderately with 6.56, 2.06 mean and S.D values respectively.

TABLE – 2: PEARSON CORRELATION AMONG QUALITY CIRCLE ACTIVITIES, INNOVATION AND COST REDUCTION

Variables	Quality circle activities
Innovation	**.486***
Cost reduction	**.455***

* Correlation is significant at the 0.01 level (2-tailed)

Table 2 reveals that there is significant positive relationship exist between quality circle activities and innovation. The r value 0.486 at 1% level of significance shows that if quality circle activities increase the innovation will also increase Jain (2001) revealed that ultimately quality circles will lead to improved performance. Developing creativity and an innovative spirit, also Inspire team work and develops harmonious relations. This result was synchronized with the result of Ken Kitazawa (2012) who revealed in his study that term of members' diversity and motivation across-organisational QCC's activities have created innovations through promoting effective.

The table shows that there is positive relationship between quality circle activities and cost reduction. The r value reveals .455 with 1% level significance reveals that when quality circle activities increase cost reduction in production also increases. It was supported by Bjorne Grimsrud et.al. (2003) in his empirical work indicates that a combination of involvement, partaking in decisions and economic rewards are required for employee participation to significantly influence cost reduction in productivity.

TABLE – 3: MULTIPLICATION REGRESSION ANALYSIS FOR INNOVATION, QUALITY CIRCLE ACTIVITIES AND COST REDUCTION

S.No	Variables	Quality circle activities
	constant	24.371
1.	Innovation	-0.32
2.	Cost reduction	.334
R^2		.213

Dependent variable: Quality circle activities

Multiple regressions have been applied to predict the quality circle activities in manufacturing companies for two variables innovation and cost reduction. Though correlation coefficients reveal positive relationship between selected variables, the regression analysis reveals that among two variables the most significant variable which influences quality circle activities is cost reduction and second variable is innovation. The overall R^2 found to be .213that is 21 percent of variation in quality circle activities has been explained by these two variables. Shantanu Kulkarni et.al, (2017) have revealed in his study that by solving the problems and also making desirable improvements, quality circles contribute in increasing the quality, productivity and safety of the operations. More importantly the workers develop a positive and problem solving attitude by participating in the QC activities and derive more job satisfaction. Anand Jayakumar et.al,(2015) in his study exposed that organizations are actively trying to involve grass root employees in continuous improvement. In order to involve them in productivity and process efficiency improvement activities, a team-based environment must be developed in which they can participate actively in improving their process, product, or service performance. One such employee participation program is Quality Control Circles (QCCs).Quality Circle is one of the employee participation methods which implies the development of skills, capabilities, confidence and creativity of the people through cumulative process of education, training, work experience and participation .It is a people – building philosophy, providing self – motivation and happiness in improving environment without any compulsion or monetary benefits. In order to improve creativity of quality circle members management have to educate and train the members technically with latest updates. Subsequently it increases innovation of members it also supported by the study of Ken Kitazawa (2012).

CONCLUSION

The findings of the study interpret that cost reduction and innovation have positive and significant relationship with quality circle activities. Through regression analysis it is implied that 21 percent variation in QC activities were explained by these individual variables. The result of the study suggested that members believed participation in quality circles activities has resulted in improving cost effectiveness and innovation in manufacturing companies. It is also found from the result that members are willing to participate in QCs activities and management needed to supports quality circle activities by implementing suggestion taken by circle and providing due recognition for their contribution so that members will get the feel of high satisfaction in the work they perform. And organization has to provide training and update the latest technology of manufacturing to make the members more creative and to improve the productivity. Finally the result shows that quality circle activities have greater impact on innovation and cost effectiveness in manufacturing companies.

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