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Recommendation for improving sugar quality and production in sugar industry through quality circle

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Abstract

Today's era is the era of enormous competition among many manufacturing industries where keen attention is emphasized not only to manufacturing their products but also their overall quality aspects have to be met properly. Also, every industry ultimate goal is to keep their production high with overall decrease in cost to achieve high productivity with superior quality in the market. For this, the criteria of Quality- its definition, its objectives, techniques & its implementations are being discussed. This thesis is all about to study the quality aspects in the sugar industry & minimize the flaws or errors by improving the quality or modifying it. Not only this, it also deals with certain techniques of quality and introduction to quality circle. The growing concern is to meeting the demands of sugar in sugar industries without compromising in terms of quality. So certain process in manufacturing of sugar is described by proper & judicious use of machines and equipments with minimum loses in output is studied in this thesis which is also the ultimate objective of it. Last but not the least, quality also depends upon management if the management apply the recommendations recommended by the quality circle members in future they can improve the production as well as quality too and can compete the international market easily.

Keywords: Quality; Sugar; Manufacturing

1. Introduction

During the post-world war the Indian Industries were generally practising traditional concept of system to manage the scientific techniques, as a result of following traditional concepts unwisely a barrier of mistrust, individualisation and non-involvement of different levels of manpower and management has been created between the important sections of organization. For example, during the Second World War era, Japan was worst hit by the above mention crisis and individual units in Japan were going from bad to worse and it was necessary for Japan to put their shattered economy back to path. For that they had to flash out their poor image of quality, with the help of some quality experts from America, namely Dr. Deming and Dr .Juran. At this point Dr. Ishikawa of Mushashi Institute of Technology, Tokyo added a new technique to this effect by involving task performer at the grass root level to work towards the quality improvement. He motivated the worker to follow the Quality control, techniques in the shop floor by forming the small groups and sought their help in solving the daily problem occurring during the production of the job, as the entire workforce who is actually doing the job knows the job best. This was the basic step in forming the modern concept of quality. Hence, by introducing this modern concept of quality control in any organization employees at the grass root level have the opportunity to perform effectively and meshing well with the activities of other levels, i.e., full involvement of the

worker and the intellectuals and hence there was a tremendous change in working environment between the management and workforce. Various studies have been conducted on the implementation of this modern concept of quality in different organization and the result was very encouraging. (Talib and Ali, 2003)

Quality Circle is a small group of 6 to 12 employee doing similar work who voluntarily meets together on a regular basis to identify improvements in their respective work areas. Quality circle is also a volunteer group composed of workers, usually under the guidance of their supervisor (or an team leader), who are trained to analyse and solve work-related problems and present their feasibility of solutions to management in order to improve the performance of the corporation, motivate and enrich the work of workers. Quality circles are analternative to the rigid concept of division of workers, where workers operate in a more narrow scope and individualized functions. Typical topics are improving safety and health, improving design of the product, and improvement in the workplace and production processes. The term quality circles derive from the concept of PDCA Plan, Do, Check, Act) circles developed by Dr. W. Edwards Deming. Quality circles are typically more official groups. They meet routinely on company time and are trained by adequate persons (usually as facilitators) who may be personnel and industrial relations specialists trained in human factors and the basic expertise of problem identification, collection of data and analysis, basic statistics, and determination of solutions. (ShantanuWelekar and ShantanuKulkarni, 2013). Quality Circles is a term used in human resources management that refers to the technique of motivating workers by allowing them input into decisions concerning the manufacturing process, thereby increasing production and productivity. A quality circle is management techniques that assign the help of employees in solving problems related to their work. Joel E. Ross and William C. Ross (1982) define a quality circle as "a small group of employees doing similar or related work who meet regularly to identify, analyse, and solve product quality and production problems and to improve general operations. The circle is a relatively self-governing unit (about ten workers), usually led by a supervisor or a senior worker and organized as a work unit." The basic concept of worker participation was effectively used by many people in America in 1940s and one of the most famous users was Walt Disney. Peter Drucker (1974), in his book Management, has also reported group activities that took place in Germany during 1980. The growth of participatory and work innovative programs such as quality circles, participative management, and employee involvement has taken place in America since the early 1970s. Frank Squires (1981), reviewed in Quality magazine, the origin of statistical quality control techniques that were achieved through group participation. In 1925 in New Jersey AT &T had just acquired Bell Laboratories, Dr. Shewhart, Dr. Dodge, Dr. Roming& others share the honour for developing statistical quality control and the classic work was done on this subject "The Control of Quality of the Manufactured Products" was appeared in 1931 by W.A. Shewhart. In late 1950s, Sidney Rubenstein started a program called Participative Management system and basic was the same as of Quality Circles. Carl Harshman (1982) expressed his view that the United States may experience the most significant change in the work place since the Industrial Revolution and the movement may involve a transformation from the traditional, bureaucratic style of management to a more participatory relationship. This new philosophy, known as participative management, attempts to improve the usage of human resources by involving individual workers in decisions affecting their work.

2. Literature Review

- **Efraim Turban, Jacob Y. Kamin (1984)** describes a methodology for a cost-benefit analysis of quality circles. The major objectives are to increase productivity, the quality of products, and the quality of work life.

- **Yehiel Rosenfeld, Abraham Warszawski and Alexander Laufer (1991)** describe some counterintuitive arguments claiming that the special characteristics of such project organizations actually create even better opportunities for QCs in work settings.
- **John D. Blair, Kenneth D. Ramsing (1983)** describes some implications and caveats for the use of quality circles as a basis for improving quality and productivity.
- **Jr King, Kh Tan (1986)** describe about the Quality circle. The quality circle is not , as is often assumed , a 'quick-fix' motivational/productivity technique for improving quality, increasing output and reducing costs as well as improving labour relations.
- **Dean Elmurti, Yunus Kathawala (1990)** describe a longitudinal field study that compares changes in perceptions of productivity and job satisfaction for participants and nonparticipants in a computer aided quality circles program in a multinational firm in Saudi Arabia. The results of this study indicated that participation in computer aided quality circles program had a positive and significant impact on productivity and job satisfaction.
- **Patrick A. Liverpool, Yash P. Gupta and Arthur W. Smith (1989)** describe a number of studies have shown inconclusive findings on the impact of PDM on various measures of performance.
- **S.G Hayward, B.G Dale and V.C.M Frazer (1985)** describe a nationwide postal questionnaire survey and case study work, presents the reasons why quality circles fail.
- **B.G. Dale, M.B.F. Elkjear, A. Vander Wiele And A.R.T. Williams (2000)** describes the major findings of a literature-based study which has examined the extent or otherwise to which quality circles (QCs), business process re-engineering (BPR) and statistical process control (SPC) follow the path of fad, fashion and fit.
- **Yehiel Rosenfeld, Abraham Warszawski And Alexander Laufer (1991)** describe some counterintuitive arguments claiming that the special characteristics of such project organizations actually create even better opportunities for QCs in work settings.
- **Reinhard W. Holl, Matthias Grabert (2002)** describes the outcome of diabetes therapy falls below the targets set up in recent guidelines.
- **Talib and Ali (2003)** describe quality circle in the workshop of university polytechnic AMU Aligarh.
- **T. R. Abo-Alhol, M. Y. Ismail, S. M. Sapuan and M. M. Hamdan (2005)** describe the impacts of participation on 109 QCs members from five Malaysian companies participated in a survey.
- **Raj Kumar, Dixit Garg and T.K. Garg (2009)** describe how employee involvement as quality circle brings optimum profit and good working environment in an automobile industry.
- **Vishal V. Gaikwad, Anita V. Gaikwad (2009)** describe implementation of Quality Circle in the field of Library and Information Science the results and conclusions outcomes will not only be amazing but it will also help us to stumble on outside over our own lacunae and facilitate designing of a better system.

3. Problem Formulation

From the literature survey it is evident that all industries whether manufacturing, service or any other are facing problems like wastage, increase in production cost, poor quality and low

production etc. while describing these problems the literature also provided the solution adopted by the industry to solve the above problems.

The present study has been designed on the same pattern to access the necessities and possibilities of implementation of Quality Circle approach to improve and enhance production and quality in competitive scenario.

Low production, increased productivity cost, low quality are the general problems faced by manufacturing industries like sugar industry, textile industry and steel industry etc. based in Haryana.

For present work Sugar industry, The Panipat Co-op Sugar Mill Limited, Panipat (Haryana) has been selected. The industry facing problems of low production and low quality of sugar, which continuously affects the morale of management and incentives of staff in a negative manner.

Production and quality is the core of success and failure of the industry. Therefore continuous increase in production with quality is an absolute necessity in today's competitive environment for any manufacturing industry to survive.

In this case Quality Circle has been developed within the organization to solve the low production and quality problem. Study is based on:

1. Identification of various processes of sugar industry in general.
2. Development of Quality Circle with in the work group.
3. Detection of factors affecting Production and Quality of Sugar industry.
4. Identification of main causes of low production and quality with the help of brainstorming session using other Quality Circle tools.

5. Objective of Research

The primary objective of the present study is to improve the production and reduce the cost by the implementation of the ideas generated through quality circle. The main aim of the problem is to show that ideas generated by quality circle leads to production improvement in manufacturing. The secondary objective of research is to keep cost and quality in mind while improving production. Quality circle:- It is an an effective way to generate lots of ideas on a specific issue and then determine which idea – or ideas – is the best solution. Quality circle is most effective with groups of 8-12 people and should be performed in a relaxed environment. If participants feel free to relax and joke around, they'll stretch their minds further and therefore produce more creative ideas. Quality circle:- It is an an effective way to generate lots of ideas on a specific issue and then determine which idea – or ideas – is the best solution. Quality circle is most effective with groups of 8-12 people and should be performed in a relaxed environment. If participants feel free to relax and joke around, they'll stretch their minds further and therefore produce more creative ideas. Define your problem **.**Give yourselves a time limit. shout out solutions to the problem while the facilitator writes them down. Select the best ideas. Write down about five criteria for judging which ideas best solve your problem. Give each idea a score. The idea with the highest score will best solve your problem.

6. Result and Discussion

Production increased before and after implementation:

Sr.no.		Before change/month	After change/month
1	Metal for bearings	54000 tonnes	54600 tonnes
2	Teeth of scrapper	54000 tonnes	54600 tonnes
3	Lubrication system	54000 tonnes	54900 tonnes

Total increased in production after changes is 600 + 600 + 900 = 2100 tonnes/month
Before change production is 54000 tonnes and after changes 54000 + 2100 = 56100 tonnes/month
So total increased in production in percentage 2100*100/54000 = 3.88%.
The industry was using old metal for bearings and teeth of scrapper without any changes and the technology was old and the mill settings were not changed since installing the mill house, that causes the low production. After the recommendations for change in metal for bearings and teeth of scrapper and changing the mill settings there is increase in production of 3.88% (minimum) so the profits will be in crores. The quality can be also improved by taking tight look on the sugarcane variety and quality of sugar can increase by adopting the double clarification process in the plant. It is found that higher production and good quality results in higher volumes sales and profits. It is beneficial to all concerns as stated below:

- Benefit to concern – it provides more profit, ensures stability of concern, and wide spread market.
- Benefit to worker – Higher production permits more incentives, more incentives means better living, higher production yields improved moral and greater satisfaction.
- Benefit to customer – Good quality product which provide satisfaction to customer.
- Benefit to nation – It provides greater national wealth, increases per capita income, expansion of international market with the help of standardized and good quality goods, improves standard of living, better utilization of resources of nation.

7. Conclusions

It is the well-known fact that the sugar industries are facing problem of low production and poor quality. People are not aware of the basic reasons that cause the low production and poor quality of their unit but they want to achieve the higher production, good quality and at the same time higher profit margins. There is lack of new technology awareness in sugar industry. The production and quality can be improved by applying quality techniques which could only be analysed from cause and effect diagram. The present study shows:

1. Quality circle approach can increase the quality of product and profitability of the organisation.
2. Quality circle activities are the source of great motivation to the employees and it will help to improve morale of the operators and other staff of organisation.
3. By quality circle activities the worker feels free to give their suggestions to the management.
4. After quality circle implementation the communication between the employees and management has improved.
5. After the implementation of quality circle in sugar industry the production can be increased by 3.88%.

At last it can be concluded that if the management apply the recommendations recommended by the quality circle members in future they can improve the production as well as quality too and can compete the international market easily.

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