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AWARENESS AND IMPLEMENTATION OF QUALITY CIRCLE IN INDIAN MANUFACTURING INDUSTRIES: A REVIEW

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Abstract

This paper explores the awareness and implementation of quality circles in Indian manufacturing industries. Quality circles, originating from Japanese management philosophies, have gained traction to increase productivity, enhance product quality & engage employees for problem-solving initiatives. Despite concerted efforts to raise awareness through seminars, workshops, and training programs, challenges such as resistance to change, lack of management support, and cultural barriers have hindered effective implementation. However, success stories highlight tangible benefits including improved product quality, increased employee engagement, and enhanced organizational performance. Looking ahead, opportunities lie in leveraging Industry 4.0 technologies and fostering a culture of continuous improvement. By embracing quality circles as a strategic tool, Indian manufacturing industries can enhance competitiveness and achieve sustainable growth.

Keywords: Quality Management, Quality Circles, Indian Manufacturing Industries, Management Support, Cultural Barriers.

1. INTRODUCTION

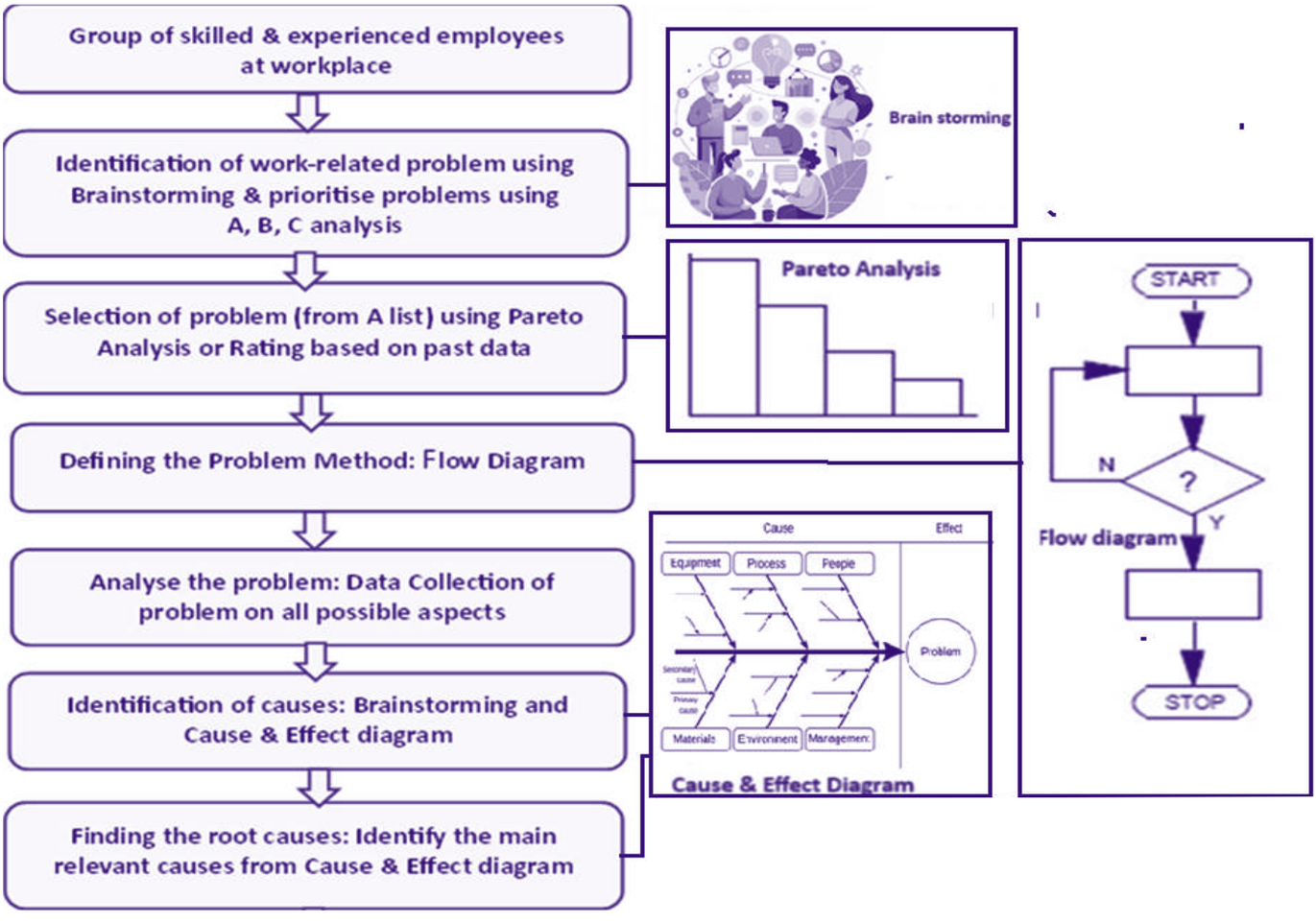
Quality circles, a participative management technique, gained significant popularity in the Indian manufacturing sector during the latter half of the 20th century. Originating from Japan in the 1960s, quality circles were introduced in India as a means to enhance productivity, improve quality, and foster employee involvement (Prakash Majumdar, J., & Murali Manohar, B., 2011). Quality circles concept was first introduced in India in the late 1970s, primarily influenced by the Japanese quality management philosophies such as Total Quality Management (TQM) and Kaizen. Indian manufacturing industries, facing increasing competition and quality concerns, saw quality circles as a viable solution to address these challenges. The early adopters were predominantly large-scale manufacturing units, particularly in the automotive and engineering sectors (Kumar, N., & Mittal, V., 2015). The initial phase saw a surge in awareness campaigns, seminars, and workshops conducted by industry associations, government bodies, and consulting firms to introduce the concept of quality circles to Indian manufacturing organizations. As awareness grew, many companies initiated pilot projects to test the efficacy of quality circles in their respective workplaces. The positive outcomes observed during these pilot projects further fueled the adoption of quality circles across various industries.

2. QUALITY CIRCLE IMPLEMENTATION IN CONTEXT WITH INDIAN MANUFACTURING INDUSTRY

The process of quality circles implementation in Indian manufacturing industries encompasses several distinct stages aimed at fostering employee involvement, problem-solving, and continuous improvement. Firstly, the formation of Quality Circle Teams marks the initial step in the implementation process. These teams consist of employees from diverse departments who voluntarily come together to address quality-related issues within the organization. This formation is crucial as it facilitates cross-functional collaboration and diversity of perspectives, ensuring comprehensive problem-solving approaches (Watanabe, S., 1991). The Mechanism of quality circle is shown in Fig.1. Following team formation, comprehensive training and education sessions are conducted to equip team members with required expertise and cognition to effectively contribute to quality circle activities. These training sessions typically cover problem-solving techniques, communication skills, and various quality improvement methodologies. By providing adequate training, organizations empower employees to actively participate in identifying, analysing, and addressing quality issues (Mittal, A. et al., 2023).

The subsequent stage involves Problem Identification and Analysis, where quality circle teams systematically analyse existing processes to identify areas for improvement. Through methods such as root cause analysis, data collection, and process mapping, teams pinpoint specific issues that impede quality or efficiency. This stage is crucial as it lays the groundwork for devising targeted action plans to address identified problems. Once problems are identified, teams proceed to the implementation of solutions phase. Here, teams collaborate to implement proposed solutions, putting action plans into practice. Teams closely monitor the implementation process, tracking the effectiveness of solutions and making necessary adjustments along the way. This iterative approach ensures that implemented solutions align with organizational goals and yield tangible improvements (Kulkarni, S., Welekar, S., & Kedar, A., 2017). Finally, evaluation and recognition play a pivotal role in sustaining the momentum of quality circle activities. Regular evaluation of team performance and project outcomes allows organizations to assess the effectiveness of quality circle initiatives. Recognition of team achievements, whether through rewards, incentives, or public acknowledgment, fosters a continuous improvement culture and motivates employees to actively engage in quality circle activities. Quality circle is an influential approach to improve product quality and processes which holds the key to competitiveness in the global market irrespective of the size of the company. It is an approach which involves continuous improvement by everyone in the organisation. In Quality Circle (QC), employees usually meet voluntarily on a regular basis to identify, analyse and solve their problems. In Indian industries, some successful examples of quality circle (https://greendot.co.in) are; i) The 'Sunrise Quality Circle' which was promoted by Hero Honda Motors to provide solution to the problem of Honda bikes due to a local manufacturer which was affecting company's reputation. It is used to increase customer satisfaction. ii) TATA Refractories Limited, Belpahar, Orissa promoted 'Niharika QC'. The sweepers found that using brush fibre bristle was more effective in cleaning of oil spills in the maintenance department where they worked Re- using of plastic brush fibres from Toyota Vacuum cleaner of the department leading to better housekeeping and safe working conditions. Some of the research papers in which quality circle methodology used in the context with Indian Manufacturing Industry are shown in Table 1.

Figure 1. Mechanism of quality circle



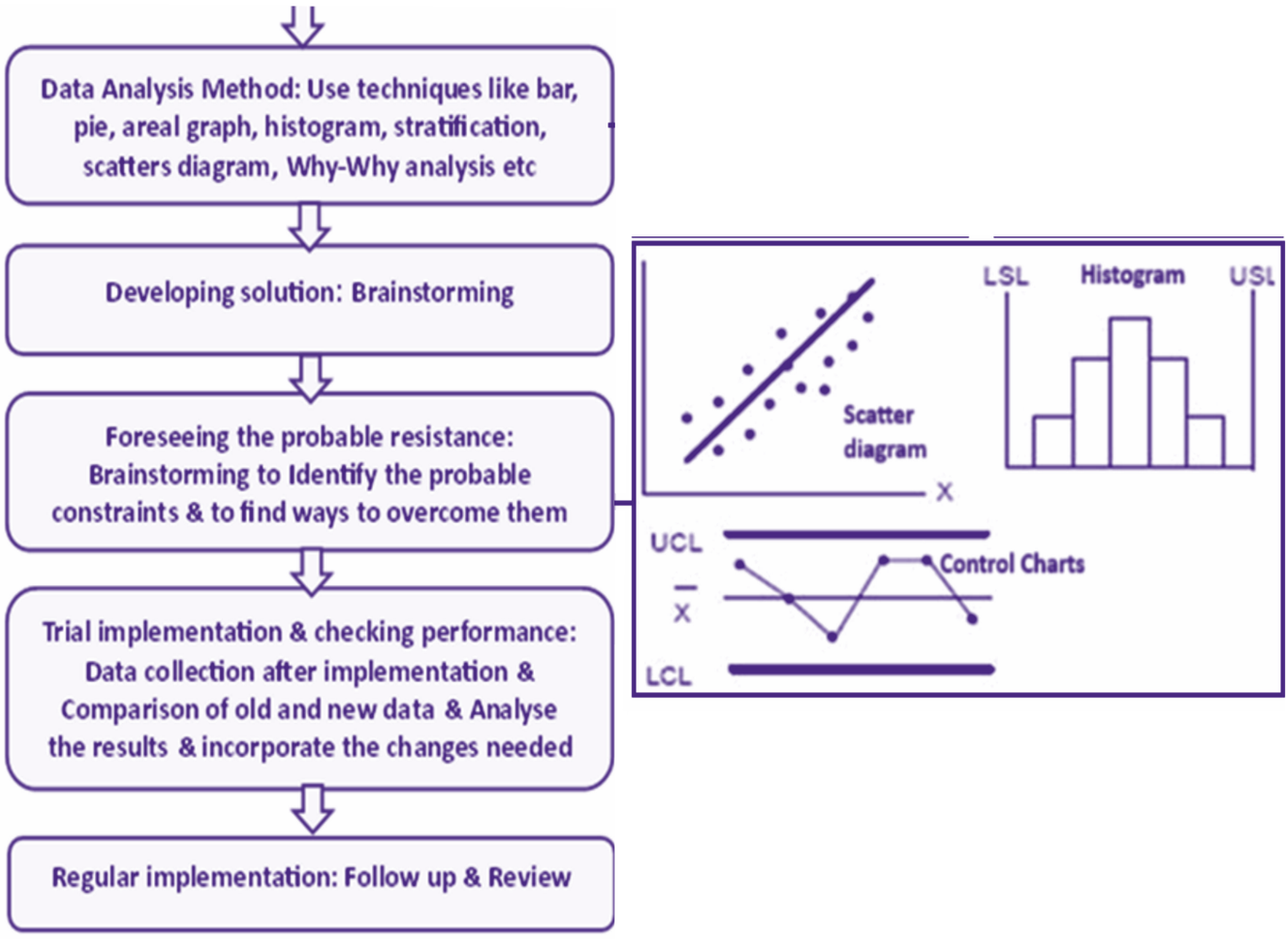


Table 1. Quality Circle in Context with Indian Manufacturing Industry

1	**C. Vijaya Banu (2007)**	studied QC development in Bharat Heavy Electricals Limited, Tiruchirapalli unit. Each QC has at least ten workers with goal commitment. This qc team meet regularly & routinely to recognize, break down and resolve issues identified with their work zone.
2	**J. P. Majumdar & M. B. Murali (2011)**	discussed the issues such as operational planning design issues, quality circle design and implementation issues and operational issues, recognition issues etc. to show the quality circle an effective and successful tool. They also explained the causes for the possible failure of the quality circles in the manufacturing industries during the implementation quality circle.
3	**A. Sharma & Rajkumar (2014)**	showed that quality circle is an important concept which was successfully implemented in the manufacturing of bucket elevator a very successful machine in agriculture industries. These elevators are used in mostly food and/ or grain industries sector. This machine helps in reducing man power and their efforts to lift the material up to the height of the machine. The drawbacks of these elevators are overcome after successful implementation of quality circle.
4	**S. Kulkarni, S. Weleker & A. Kedar (2017)**	suggested that the QCs can be successfully implemented in a medium scale industry. A case study of application of the quality circle concept in a powder coating unit to improve the productivity. The article also explained the factors that are important for the success of the quality circles.

5	**R. S. Kalva & V. Srinivasu (2017)**	conducted quality circle case study at Tecumseh Product Company which is a leading compressor manufacturing division. The study resulted in tangible outcome such as cost saving and intangible outcomes such as team working and knowledge sharing, team spirit enhancement. job satisfaction and improved cleanliness. Analytical and decision-making skills are also improved.
6	**L. K. Biban, Arun & D. Dhounchak (2017)**	presented an overview of the philosophy and Quality Circle. This article discusses with various issues related to plant layout, material handling, and safety identified in small and medium enterprises. Quality circle procedure is particularly especially good for solving small, manageable, focused issues. A case study is implemented in a single work area of SME and demonstrated visible results in a relatively short period of time.
7	**S. R. Rath and I. Mohanty (2018)**	focused on the impact of quality circle towards employees and organization. The importance and awareness of training with good leadership qualities are the success of quality circle in any organization. Moreover, this study reveals the positive attitude will be developed that leads to overall improvement in organizational culture and performance of employees. They studied practice of quality circle practises at leading organizations such as Rourkela Steel Plant (RSP) and SAIL.
8	**S. Subbulakshmi (2018)**	studied the impact of employee motivation and their performance in quality circle activities on product quality. To implement this strategy, standard questionnaire was designed and data collected from members of quality circle in 18 manufacturing companies. The data were analysed through Pearson correlation and regression analysis. The analysis results shows that motivation and quality circle activities are having significant and positive relationship with product quality. The study suggests that employee motivation to be enhanced, and promoted in quality circle activities to improve quality of product.
9	**A. Goyal, R. Agrawal, A. K. Sharma (2022)**	proposed a concept of 'Green quality circle' which aware shop floor employees about environmentally friendly manufacturing processes. It needs training and support of management. A case study is carried out to show the improvement in attitude of employees with respect to environment.
10	**A. Mittal, P. Gupta, V. Kumar and C. C Ki Chan (2023)**	demonstrated the use of the quality improvement tool and processes to the management of an Indian manufacturing organisation. This study provides a step-by-step approach for the implementation of the quality circles. They demonstrated the utilisation of seven quality control tools in line with the steps of the plan-do-check-act cycle. After implementing the quality control circle rejection rate of compressors is reduced by 50% with inspection time and rework.

3. CHALLENGES FACED IN IMPLEMENTATION OF QUALITY CIRCLE

The widespread adoption of quality circles in Indian manufacturing industries has undoubtedly brought about notable benefits, yet the implementation process has not been without its challenges. One significant hurdle encountered is the Resistance to Change, particularly from middle management and frontline supervisors. These stakeholders often perceive quality circles as a threat to their established authority and control within the organizational hierarchy. This resistance can manifest in various forms, including skepticism towards new approaches to problem-solving and reluctance to cede decision-making power to frontline employees. Another critical challenge is the lack of management support, which has hindered the effective implementation of quality circles in many organizations. Despite the importance of top-level endorsement and commitment, some management teams have failed to provide adequate support, resources, and guidance for quality circle initiatives. This lack of support can lead to insufficient funding, limited autonomy for quality circle teams, and a perception that quality circle activities are of low priority within the organization's overall strategy (Shrivastava, N., & Jain, A. K., 2020).

Cultural Barriers also pose significant challenges to the successful implementation of quality circles in Indian manufacturing industries. Hierarchical structures and traditional communication norms can impede effective collaboration and problem-solving within quality circle teams. Moreover, cultural tendencies towards maintaining status quo and reluctance to share ideas openly can inhibit the free flow of information and creativity essential for identifying and addressing quality-related issues. Additionally, Sustainability Issues have emerged as a prevalent challenge for many organizations implementing quality circles. While initial enthusiasm and momentum may drive successful pilot projects, sustaining long-term engagement and commitment proves to be more challenging. Factors contributing to sustainability issues include a lack of clear long-term vision for quality circle initiatives, inconsistent leadership support, and insufficient efforts to foster ongoing employee engagement and participation (Talib, F., & Ali, M., 2003).

4. FUTURE PROSPECTS OF QUALITY CIRCLE IN MANUFACTURING SECTOR

Despite encountering significant challenges, quality circles remain a promising avenue for Indian manufacturing industries, particularly within the context of Industry 4.0. This era of digital transformation and technological advancement underscores the importance of agility, innovation, and customer-centricity. Quality circles, with their focus on employee involvement and continuous improvement, align closely with these evolving industry trends. By empowering employees to actively participate in problem-solving and process improvement initiatives, quality circles can help organizations adapt to changing market dynamics and enhance their competitive edge. Central to the future success of quality circles is the need to Foster a Culture of Continuous Improvement within organizations. This entails creating an environment that values employee participation, fosters a spirit of innovation, and embraces change as a catalyst for growth and competitiveness. By instilling a culture of continuous improvement, organizations can cultivate a mindset of excellence and drive sustainable performance improvements across all levels of the organization (Aravindan, P. et al., 1996). Furthermore, Enhancing Leadership Commitment is essential to ensure the effective implementation and sustainability of quality circle initiatives. Top management must demonstrate unwavering support and active involvement in quality circle activities, providing the necessary resources, guidance, and recognition to foster a conducive environment for employee-driven improvement efforts. Leadership commitment serves as a critical enabler for overcoming resistance to change, aligning organizational priorities, and fostering a sense of ownership and accountability among employees. Incorporating Technology into quality circle processes is another imperative for ensuring their relevance and effectiveness in the future. Leveraging digital tools and technologies can streamline quality circle activities, facilitate collaboration among team members, and enable data-driven decision-making. From online collaboration platforms to advanced analytics tools, technology offers opportunities to enhance the efficiency and effectiveness of quality circle initiatives, particularly in an increasingly digitalized manufacturing landscape (Maheshkumar, S. et al., 2009). Finally, Investing in Training and Development is essential to equip employees with the necessary knowledge, skills, and mindset to drive quality improvement initiatives effectively. Providing regular training and skill development opportunities enables employees to stay abreast of emerging best practices, quality management methodologies, and technological advancements. By investing in employee development, organizations can empower their workforce to lead quality circle initiatives with confidence and competence, driving meaningful improvements in quality, productivity, and customer satisfaction (Sandeepsoni, D. et al., 2015).

5. CONCLUSION

Quality circles have undoubtedly made significant contributions to enhancing quality, productivity, and employee engagement in Indian manufacturing industries. While the journey has been marked by challenges and setbacks, the evolution and continued relevance of quality circles underscore their potential as a powerful tool for driving continuous improvement and organizational excellence. With the right leadership commitment, cultural transformation, and technological advancements, quality circles can pave the way for sustainable growth and competitiveness in the dynamic landscape of Indian manufacturing. The awareness and quality circles implementation in Indian manufacturing industries have witnessed a notable evolution since their introduction in the late 1970s. Initially influenced by Japanese quality management philosophies, Indian organizations gradually recognized the potential of quality circles to address productivity and quality challenges. Over the years, concerted efforts by industry associations, government bodies, and consulting firms have significantly raised awareness through seminars, workshops, and training programs. Despite these efforts, challenges such as resistance to change, lack of management support, and cultural barriers have impeded effective implementation in many organizations. However, success stories of quality circle implementations highlight their tangible benefits, including improved product quality, increased employee engagement, and enhanced organizational performance. Looking ahead, there are considerable opportunities for further growth and development of quality circles in Indian manufacturing industries. The advent of Industry 4.0 technologies presents new possibilities for

integrating quality circles into digitalized manufacturing processes. Moreover, as organizations increasingly prioritize sustainability, quality circles can play a pivotal role in driving continuous improvement initiatives aimed at reducing waste and optimizing resource utilization. To capitalize on these opportunities, organizations must foster a culture of continuous improvement and learning, empowering employees to identify and implement innovative solutions. By leveraging quality circles as a strategic tool, Indian manufacturing industries can enhance competitiveness, achieve sustainable growth, and navigate the complexities of the modern business landscape.

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