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Strategic Implementation of Continuous Improvement Approach

Improving the Performance of Small and Medium-Sized Enterprises

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Preface

In this competitive world, industrial organizations are focusing to enhance their productivity through system simplification, organization potential, and incremental improvements by using modern techniques like continuous improvement (CI) or KAIZEN. The present book seems to fulfill an obvious need to write for a variety of reasons. Firstly, although the concept of KAIZEN is familiar to engineers, their treatment of it has always been narrowly focused. Secondly, many people, including engineers, are still wrestling with the difficulties associated with the concept, its applications, and implementation on the shop floors. Thirdly, the role of engineers seems to be more and more positively enhanced nowadays. Their involvement is much more widely spread than previously thought. As KAIZEN tends to focus on business organizations as total dynamic systems, its portrayal in the present form should help engineers appreciate the level of penetration and wide implications. KAIZEN is an evolutionary but umbrella concept that covers all aspects of business units.

KAIZEN is a means to drive the business rather than just being a loose input. It is unfortunate that cynics who consider CI to be just a craze have failed to visualize the evolutionary process by which considerable growth in possible.

This book aims to present a comprehensive approach which is intended to broaden the knowledge of engineers and others concerned with KAIZEN and its implications on their working environment. It is also intended for students and researchers who have to wrestle with this concept in the course of their various studies.

Nonetheless, the authors are grateful to all the people whose ideas have helped shed some light on specific areas of KAIZEN and whose contributions in this field are valued and greatly appreciated by all those who aspire to progress and advancement.

The authors are also grateful to their parents for their support and understanding at all stages of writing this book. Finally, the authors devote this work to THE ALMIGHTY GOD, the only one who has granted them the willingness and ability to successfully complete this book.

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Contents

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Abstract

Continuous improvement (CI) is a technique to improve the performance at every level of operation, in every functional area of an organization, by maximum utilization of available resources. It is a management approach that focus on enhancement of manufacturing processes through incremental changes. It is a management approach of identifying and eliminating waste (all non-value-added activities) through incremental improvements by reducing the time associated with setup in pursuit of perfection. CI programs have evolved from traditional manufacturing focused systems that concentrate on the production line to reduce waste and improve the product quality, into comprehensive, systematic methodologies that is focused on the entire organization. To achieve excellence in every sphere of the world is not a fortnightly process. If it is not taken care of, the competencies gained by the organization might fade away with the passage of time. The organization must consistently send a strong message to employees that continuous improvement strategies are the core values of the company. Different strategies of CI approach are being used by the manufacturing organizations to improve the performance of current manufacturing system processes.

The present study is an attempt to check the performance of KAIZEN technique in small–medium enterprises (SMEs) of Northern India. A survey of 101 SMEs has been performed in Northern India. The level of usage, level of importance of different strategies, level of importance of different enablers, and the important benefits achieved from KAIZEN implementation have been identified. Correlation analysis shows significant relationship between different CI strategies and benefits of CI approach. SMEs use total quality management (TQM) strategies to its highest maturity level. Two case studies have been performed to ascertain the important benefits occurred after CI strategic implementation. CI strategies including value stream analysis, redesign, suggestion system, failure mode effect analysis, process flow mapping, recognition, minor stoppage elimination, and customer quality, cost and delivery analysis (QCD) through holistic CI implementation program can significantly contribute in harnessing incremental improvements in the organization, thereby providing a sound platform for the organization to compete effectively in the dynamic environment. CI activities through strategic implementation can

contribute towards quality enhancements by eliminating deteriorations in production systems but also have negative impact on the safety-related issues of employees. The study critically reveals the contributions of CI strategic implementation for achieving manufacturing performance improvement through quality initiatives in the SMEs of Northern India. The study reported in this work has revealed that there is a benefit of CI strategic implementation in the Indian industry and there is a need to develop an implementation plan to foster CI implementation practices and procedures. Overall equipment effectiveness (OEE) parameters seek to encourage the setting of ambitious, but attainable, realistic goals for raising the OEE by focusing on the losses related to availability, performance, and quality of a system. It prepares the plant to meet the challenges of competitive manufacturing by adoption and implementation of a well-conceived plan with the help of preventive maintenance teams for effective equipment maintenance.

Strategic implementation of CI approach systematically aims at improving the OEE using setup time reduction. Six Sigma approach is helpful in achieving process improvement and thereby achieving different goals of productivity and the organization. The successful implementation of single-minute exchange of die (SMED) and other CI strategies are the key to a competitive advantage for any manufacturer that produces, prepares, processes, or packages a variety of products. The reduction of defective part million opportunity (DPMO) level from 75655.25 to 455.26 has been obtained to enhance the performance of manufacturing unit. The net savings of 17.65 lacs per year have been obtained after the successful implementation of the DMAIC approach. Six Sigma provides an effective mechanism to focus on customer requirements, through improvement of process quality. CI has proven to be a means to supplement the concerted improvement efforts by addressing equipment and other related problems that affect the performance of the manufacturing system.

CI implementation in the enterprise has demonstrated the effective realization of optimized equipment effectiveness, minor stoppage elimination, and promotion of autonomous operator maintenance through day-to-day activities involving the total workforce. CI has helped the enterprise in improving the synergy between the production department and rest of the improvement functions, resulting in elimination of defects, improved process reliability like OEE, affecting cost reductions thereby strengthening sustainability efforts of the organization to meet cut-throat global competition for business excellence. It therefore becomes pertinent for the successful organizations to integrate improvement initiatives into their manufacturing strategy for realization of organizational objectives. The successful CI implementation program can facilitate the manufacturing organization's quest for achieving enhanced manufacturing performance leading to the firm's performance improvement. Thus, in today's competitive environment CI approach has proven to be an effective global strategy, for Indian organizations, rendering firms a consistent enhancement of performance in terms of achieving manufacturing performance improvement.

Implementation plan reveals that the implementation of CI strategies leads to the success of the organization by focusing on the losses related to availability, performance, and quality of a system. Structural equation modeling (SEM) shows dependency of one initiative on other initiative of CI approach. SEM is a powerful tool that enables researchers to go beyond factor analysis into the arena of determining whether one set of unobserved constructs is related to another set of constructs. Customer and supplier relations play a significant role in improving the performance of the firm and hence improve the manufacturing system processes showing high positive correlation. SEM investigates the impact of three sets of antecedent factors on the firm performance. Customer satisfaction regarding cost, delivery, and quality plays an role important role in improving the firm performance by obtaining different benefits including organization achievement, increased productivity, improved quality, reducing cost, improving safety, and timely delivery of the product manufactured.