

ABSTRACT

New Product Development process has undergone revolutionary changes during the past few years due to the emerging Global Economic Scenario. Much has been written during the past few years about Japanese practices in New Product Development. The main strength of the Japanese companies appears to be their ability to manage their costs effectively. One of the many New Product Development tools that have emerged from Japan is Target Costing, which is gaining popularity worldwide.

Today's intense competitive pressures no longer make it possible for an organization to survive-let alone prosper- by focusing on Technical differentiation alone. In this market oriented economy, organizations are striving to offer customers maximum value at minimum possible price. Target Costing has emerged as one of the powerful tools during the past few years to address the seemingly paradoxical situation of offering more value at lesser price and still maintain profitability.

Target Costing is primarily a technique for profit management. Firms use Target Costing to ensure that new products are profitable when launched. *Target Costing is a structured approach to determine the Life Cycle Cost of a product at which a proposed product with specified functionality and quality must be produced to generate the desired level of profitability over its life cycle when sold at its anticipated selling price.* However, most of the researches in Target Costing have agreed that Target Costing focuses less on cost than on customer requirements.

Researchers have identified Target Costing as a New Product Development tool in the late 1980s. Good amount of work have been reported on the managerial accounting aspects of Target Costing, Organizational issues and only very few have been reported on implementation issues in a Target Costing process, which are more technical. An integrated approach / model for Target Costing addressing the Cost and Quality Engineering issues in a Target Costing process during NPD is non-existent. The role of various supporting tools for a Target Costing process and the ways and means to use them in conjunction with Target Costing process is also non-existent in the literature. Thus the need for a research in this area to study the Cost and Quality

Engineering aspects in a Target Costing process during New Product Development was identified.

A comprehensive model for Target Costing, addressing the Quality Engineering and Cost aspects was developed. This model is a combination of two sub-models namely, Cost – QFD (C-QFD) and Supply Chain QFD (S-QFD) models. To ensure that customer requirements take priority throughout the Target Costing process, Quality Function Deployment (QFD) has been used as a primary tool in the Target Costing model.

Conventional QFD is technically one sided, in the sense that, it tends to give an over emphasize on the technical parameters. Cost Engineering, when integrated with QFD, makes the QFD a practical and economically viable one. Cost Engineering, Taguchi's Design of Experiments (DoE), QFD and Value Engineering (VE) were integrated to give a novel C-QFD model. QFD has been used to identify Customer needs and then to prioritize the Engineering Characteristics (ECs), Cost Engineering for fixing cost targets, DoE for parameter selection and VE for cost reduction. To ensure that uncertainties during cost estimation do not offset the savings generated by VE, fuzzy cost models have been developed and integrated with the C-QFD model. The developed model has been validated vide a case study undertaken at an Air Horn manufacturer based at Coimbatore, South India.

Lean manufacturers have most of their parts outsourced from qualified suppliers. Hence a bulk portion of the Target Cost to be achieved by the manufacturer relies upon the cost of the purchased parts. A portion of the Target Cost pertaining to purchased parts is deployed to the suppliers through the backward supply chain. The concepts of Supply Chain Management (SCM) have been integrated with QFD and a novel Supply Chain – QFD (S-QFD) model has been developed to aid the Target Costing process at the supplier end. The model addresses issues of allocating cost targets to various components and then the selection criteria for suppliers. The Air Horn case study has been extended to validate the S-QFD model. Two supplier selection methods viz., Supplier Quality Survey method and Fuzzy Analytical Hierarchy Process method have been used for supplier selection during the S-QFD

process. Significant contributions to the NPD process have been identified during the usage of the C-QFD models and S-QFD models for the Air Horn manufacturer.

Cost reduction pressures during NPD can lead the designers towards easy solutions thereby causing damage to the product reliability. To address reliability issues during Target Costing process, Design Failure Modes and Effects Analysis approach has been incorporated in the Target Costing model. Various potential failure modes have been identified for the Air Horn case and preventive actions were initiated for critical failure modes.

Having achieved the Target Cost, maintaining the same in the long run is a major task to any organization. Further, cost reduction pressures sought by market forces / Original Equipment Manufacturers after product launch poses a new challenge. Kaizen Costing has been added as a post-Target Costing tool to address these issues. Ways and means of using Kaizen Costing for Target Cost maintenance / Handling Cost reduction pressures has been explained vide a case study at a dashboard instrument manufacturer.

Thus the work provides an understanding on the role of supporting tools for a Target Costing process during NPD and addresses the ways and means to integrate these tools with a Target Costing process. Cost, Quality and Functionality are the three dominating elements for a products' success which is evident from the work.

It can be concluded that Target Costing together with Quality Function Deployment, Value Engineering, Supply Chain Management and Fuzzy Logic helps the organization to compete in the market and remain profitable, while Kaizen Costing helps maintain the competitive position and overall profitability.