

Role of Delivery Management in attaining Business Excellence through TQM: An Empirical Case Study

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Abstract

Delivery management plays a critical role in managing both suppliers and customers. An organization seeking to address its manufacturing flexibilities through TQM needs to adopt a holistic approach to manage its delivery issues both at the supplier as well as at the customer end. This paper presents a case study of an Indian automobile organization XYZ Ltd. that won the Deming Award in 2013 and implemented tailor-made delivery management practices for the improvement of delivery performance. An exploratory method of research has been used for the preparation of this case study. The case study reflects that with the adoption of structured delivery management practices, the organization has registered an improvement of 32% in the service level of Light Commercial vehicles (LCV), 27 % improvement in the delivery of Heavy Commercial Vehicles, and 100% improvement in the delivery performance of small batches.

Keywords

Delivery management, Deming award, customer satisfaction, TQM, automobile organization.

1. Introduction

In today's dynamic and competitive business environment, Total Quality Management (TQM) has emerged as a strategic approach to enhance organizational performance and customer satisfaction. Central to the successful implementation of TQM is the effective management of delivery processes, encompassing both suppliers and customers. The dynamic global economy is forcing organizations to compete for their survival. Many business excellence tools like TQM, TPM, Lean manufacturing, etc. play a vital role in the transformation of organizations. In this direction, the Indian industry has taken challenges very seriously and made some proud achievements in the field of achieving prestigious awards like the Deming and TPM excellence awards. Total Quality Management provides a holistic approach to achieving tangible benefits in the form of Quality, Cost, and Delivery.

The adoption of an innovative and continuously improving approach within an organization serves as a driving force for the successful implementation of Total Quality Management (TQM), leading to significant enhancements in quality, productivity, cost efficiency, safety, and delivery (Sraun & Singh, 2017). Key performance indicators such as cost of quality and unit production cost are profoundly influenced by the establishment of a robust quality management system (Bhatia & Awasthi, 2018). Within the TQM philosophy, New Product Development (NPD) is considered a subset of innovation, and there is an emphasis on promoting its digitization (Marion & Fixson, 2021). To ensure the success of new product development, organizations must proactively address uncertainties related to market dynamics and technological choices (Biazzo & Filippini, 2021). An insightful case study by Silva and Moreira (2021) explores the involvement of suppliers in the new product development process. Organizations are urged to align their policies on technology upgradation and cost management with their overall vision and mission to gain a competitive edge over rivals (Kumar & Gupta, 2020, 2021). This strategic integration is essential for navigating uncertainties and achieving success in the dynamic landscape of new product development.

Delivery management platform has also become the most important part of every e-commerce business including giant industries up to small businesses. The adoption of Delivery Management elucidates the organization's commitment to overcoming delivery challenges and enhancing internal and supplier capacities. A cross-functional management team can instrument in monitoring manufacturing flexibilities and ensuring the timely production of a diverse range of products. Aghimien et, al., 2019 have given insight into the TQM practices being adopted in the delivery of civil engineering projects in South Africa. Management can monitor manpower planning for service delivery in academic libraries through TQM (Ola 2019). Obisanya 2019 has shown that a holistic approach to the domesticability of TQM in the Nigerian public sector will lead to efficient and effective service delivery, especially its operational excellence. The application of total quality management practices is essential and influences service delivery across various public hospitals in Kenya (Badru (2018), Mwikali & Bett (2019) and Rebecca & Stephen (2022)).

Investigation of the pivotal role of Delivery Management (DM) in achieving business excellence through TQM, drawing insights into an Indian automobile organization that was honored with the prestigious Deming Award in 2013. The paper also provides a glimpse into the critical interplay between TQM and Delivery Management, emphasizing the need for a comprehensive approach to addressing manufacturing flexibilities. The case study focuses on XYZ Ltd.'s journey, showcasing how tailored delivery management practices played a transformative role in improving delivery performance across various vehicle categories.

1.1 Research Objective

To study the role of delivery management for business excellence through TQM .

2. Research Methodology

To understand the role of delivery of management to achieve desired business excellence through TQM, a case study approach has been used.

2.1 About the organization

The XYZ (name changed) organization is an original equipment manufacturer (OEM) of heavy vehicles in India. It specializes in the manufacturing of commercial vehicles in India. The organization adopted TQM in 2012 and won the prestigious Demin Prize in the year 2017. The organization adopted the TQM philosophy to achieve its objective of becoming flexible, capable of producing a wide range of products and achieving operational excellence. The improvement in the organization's operational excellence was measured as the improvement in the Quality (Q), Cost (C), and Delivery (D) indices. There were challenges in the organization in terms of manpower regulation, cost reduction, meeting delivery targets, and quality levels.

2.2 Challenges

In the period from 2012-2014 the organization had witnessed a massive slowdown in the economy and posed new challenges in terms of survival and maintenance of the market share.

- In 2013, the organization was getting orders of a batch size of 10 or less in a month and these orders accounted for 40% of the total volume. So, for the organization, it became necessary to be flexible enough to fulfill such orders.
- This flexibility offered the organization an advantageous situation by rolling the high-volume and low-volume deliveries.

So, the organization decided to meet the delivery challenges by improving the internal capacity and capacity at the suppliers' end.

2.3 Delivery Issues

The delivery management was planned to resolve the following issues

- Flexibility requirements of the plant
- To produce a wide variety of orders irrespective of batch size
- To meet the objective of 'on-time delivery of orders irrespective of batch size.

3. Implementing Delivery Management (DM)

The organization's motive for adopting delivery management was to meet the delivery challenges by improving the internal capacity and capacity at the suppliers' end. The delivery issues were resolved with the help of a cross-functional management team that was created to monitor the flexibility requirements for manufacturing a wide range of products before stipulated delivery dates. The team was also responsible for the improvement of capacity. A review of delivery measuring parameters was also carried out from time to time as shown in Table 1.

Table 1. Delivery performance measures

S. No.	Years	Measuring unit	Shifted from	To	Frequency
1.	Up to 20 13	Quantity	---	Volume adherence	Monthly
2.	From 2014	Quantity/time	Volume adherence	Service level	Monthly
3.	From 2015	Quantity/time	Volume adherence	Service level	Monthly
4.	From 2016	Quantity/time	Monthly service level	Incomplete deliveries for n<10	Monthly

To achieve the desired targets following are some focused activities carried out to improve the delivery performance.

- I. Supplier Capacity enhancement to meet the requirement
- II. Lead time reduction (From Laydown to Sales yard)
- III. Internal capacity improvement in paint and trim shops
- IV. Implementation of policy management to reduce the incomplete deliveries of small orders

3.1 Supplier Capacity enhancement to meet the requirement

The organization focused on suppliers to resolve issues related to the supply chain. These losses were the main contributor to low delivery performance. The shortage was mostly due to the limited production capacity of suppliers. To resolve such an issue, a new 6-month capacity review system was introduced at the supplier end. This periodic review helped in the identification of gaps and the timely resolution of issues.

3.2 Lead time reduction (From Laydown to Sales yard)

The organization carried out activities to reduce the lead time for delivering vehicles. The lead time was calculated from the laydown to the sales yard as shown in Figure 1. In 2012 there was a lead time of 6.7 days against a target value of 6 days, which was quite higher. This impacted the response time to service an order. Several measures like a quality gate to reduce the rework and in-house body fitting, and the use of conveyors, etc., were adopted to reduce the lead time. The lead time of 6.7 days against 6 in 2012 was reduced to 2.6 days against 2 in 2017.

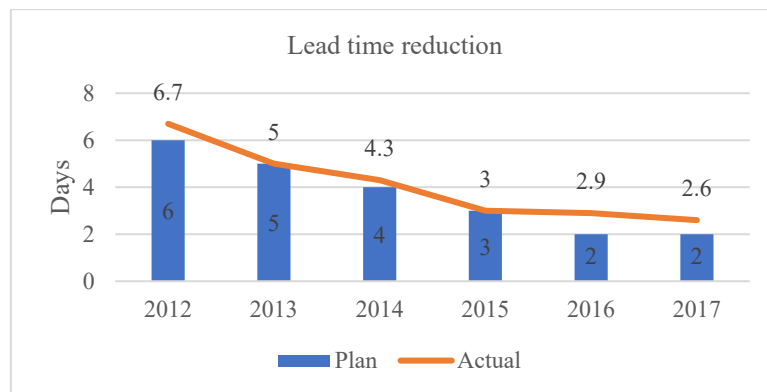


Figure 1. Lead time reduction

3.3 Internal capacity improvement in paint and trim shops

The issues of the high lead time were further reduced by developing and enhancing the in-house capabilities of the plant as a focused activity the capacities of the cabin paint shop and trim shops were increased to reduce the lead time.

3.4 Implementation of policy management for reducing the incomplete deliveries of small orders

The continuous increase in the demand increased the requirement of small batch-size orders and thus complicated the servicing of the orders. The major focus of the vision element “Flexibility” was on small batch size orders. To

address this issue through policy management new metrics were adopted by the organization as shown in Table 1.

4. Results

With the implementation of delivery management following improvements were observed.

4.1 The improved service level of LCV

Figure 2 shows the trend of delivery performance of LCV during the regime of the various metrics of flexibility. The metric was transitioned from the monthly volume adherence to the weekly service level and due to this an improvement of 32% can be observed in the weekly service level.

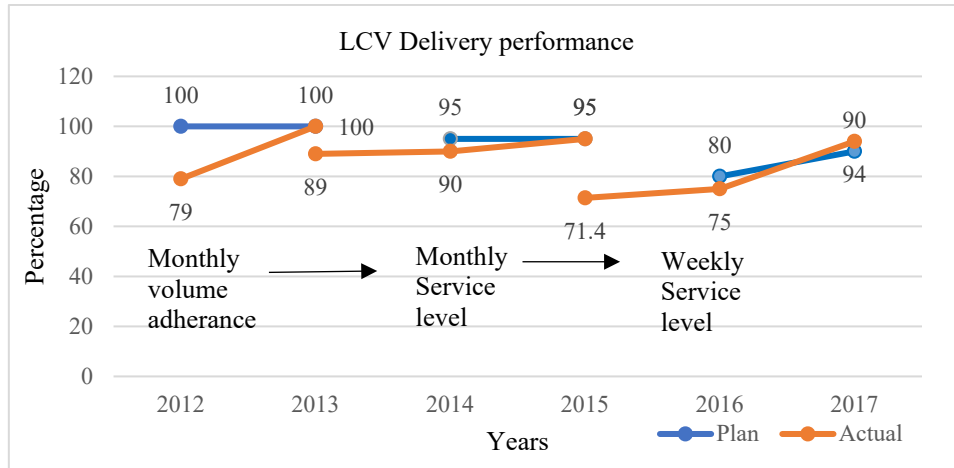


Figure 2. LCV delivery performance

4.2 The improved service level of heavy commercial vehicle

The following Figure 3 shows the trend of delivery performance of HCV during the regime of the various metrics of flexibility measurement. The change in the metric conferred an improvement of 27% in the delivery performance of the heavy commercial vehicle.

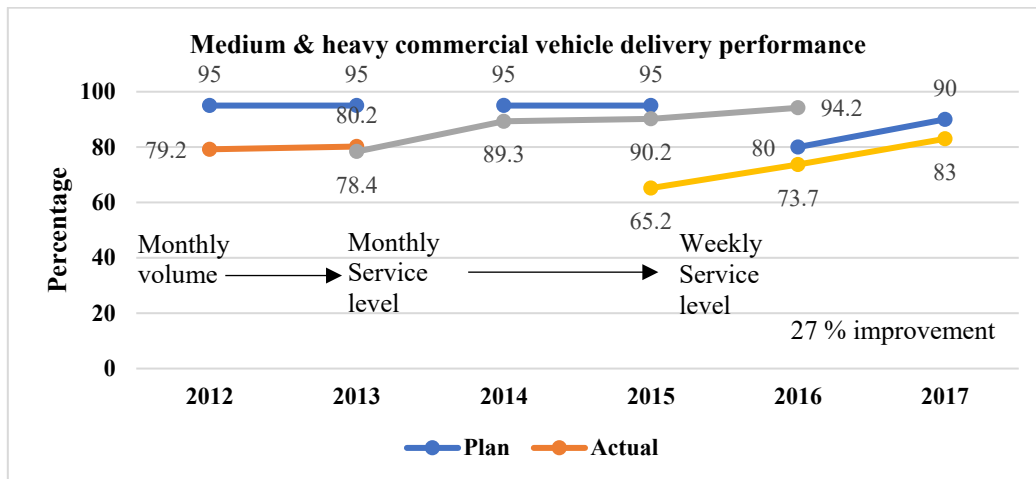


Figure 3. HCV delivery performance

4.3 Increase performance of small batch size

The following Figure 4 shows the improvement of the delivery performance of small batches $n \leq 10$. The adoption policy management and thus measuring the delivery performance by delivery of the small batches $n \leq 10$, the monthly service level has improved to 100% approximately.

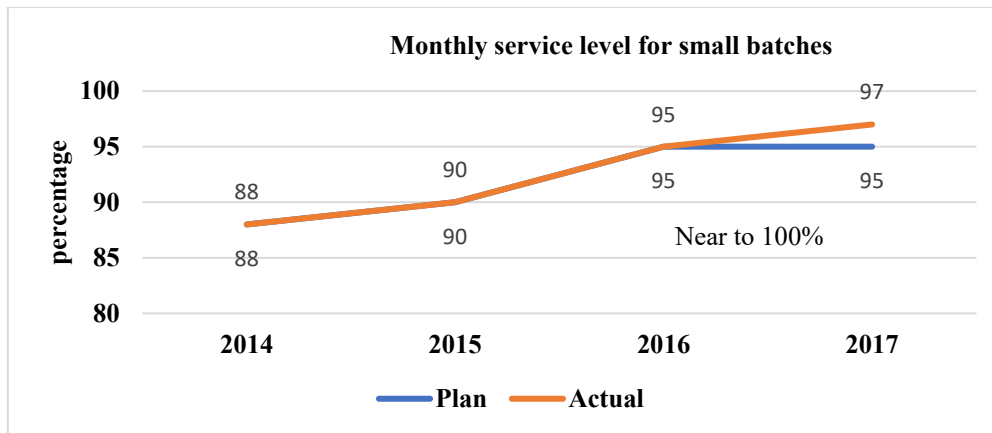


Figure 4. Capacity to deliver small batches

5. Conclusion

This paper provides a comprehensive exploration of the symbiotic relationship between TQM and Delivery Management, exemplified through the real-world case study of XYZ Ltd. The organization's success in achieving the Deming Award and substantial improvements in delivery performance underscores the transformative potential of adopting tailored delivery management practices within the TQM framework. Through empirical evidence, this study contributes valuable insights for organizations aspiring to attain business excellence by effectively managing their delivery processes in the pursuit of Total Quality Management. The paper presents tangible outcomes of XYZ Ltd.'s initiatives, showcasing substantial improvements in delivery performance:

- Improved Service Level of Light Commercial Vehicle (LCV): A 32% enhancement in the weekly service level is demonstrated in Figure 2.
- Enhanced Service Level of Heavy Commercial Vehicle (HCV): Figure 3 illustrates a 27% improvement in the delivery performance of HCVs.
- Increased Performance of Small Batch Size Orders: Figure 4 exhibits a remarkable 100% improvement in the delivery performance of small batches ($n \leq 10$), achieved through policy management.

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