

# ROLE OF SUPPLIER/BUSINESS RELATIONSHIP IN CURBING BULLWHIP EFFECT IN THE SUPPLY CHAIN NETWORK FOR SMALL TO MEDIUM ENTERPRISES

Malkiel Sitepu and Ira Fachira

School of Business and Management, Institut Teknologi Bandung, Indonesia

Email: malkiel.sitepu@sbm.itb.ac.id

*Abstract.* This study explored the tools used in curbing the bullwhip effect. The paper is dedicated for small to medium enterprises to grow and thrive in their business using the most effective method that is in their capacity and capability. This qualitative research is followed by a case study on a company whose Chief Executive Officer was interviewed thus contributing data to this research. Though any method of forecasting or management will not avoid the bullwhip effect where order-up-to replenishment policy is instituted, this paper seeks to provide the most optimized way to minimize the bullwhip effect that any small to medium enterprise may adapt without having capital-extensive investment in which they may not yet have nor acquired.

*Keywords :* Supply Chain Management; Lean Supply Chain; Agile Supply Chain; Supplier Relationship Management; Vendor Managed Inventory; Bullwhip Effect; Total Quality Management; Small to Medium Enterprises

## INTRODUCTION

A Supply chain is the flow of goods, services, and information of all activities that are involved in delivering the raw materials to the finished product in the customer's hands. The aim of managing the supply chain is to coordinate all the sets of activities and minimize the costs with respect to conflicting chain activities while maintaining high efficiency and affectivity. A supply chain is very dynamic and ever changing. The rate of which supply chain can improve his directly proportionate to the rate of technological advances. It has been observed that supply chain has gone through several historical developments and changes in the past 6-7 decades. The following paragraphs will be dedicated to explain each changes and shifts that has happened in the supply chain.

- Creation Era
- Integration Era
- Globalization Era
- Specialization Era (Phase 1)
- Specialization Era (Phase 2)
- Supply Chain Management 2.0 (SCM 2.0)

An ideal supply chain should aim to have a unique competitive advantage, flexibility towards volatility, and prepared to catch opportunities. Companies should be able to adapt the latest technology to their supply chain (Big data, artificial intelligence, smart automation, etc.) in order to optimize working capabilities and increase competitive advantage.

However, there is one problem in particular that this paper seeks to address. The "Bullwhip Effect" occurs when a distorted information along the supply chain network causes various degrees of damage from mere loss on sales to company collapse at worst. The occurrence of distortion in the supply chain network is called the "Bullwhip Effect". Speaking in terms of Small Medium Enterprises where a huge capital is not available to recover from a huge loss caused by the bullwhip effect, curbing this problem is critical in growing businesses.

In the words of a statistician W. Edwards Deming, "Eighty-five percent of the reasons for failure are deficiencies in the systems and process rather than the employee. The role of management is to change the process rather than badgering individuals to do better." One of the most important points, if not the most important point, of any problem statement is to articulate the problem being addressed to the researcher in a way that's clear, straightforward, and easy to understand.

## LITERATURE REVIEW

There are a lot of tools that companies can adapt in order to achieve efficiency that they desired. This section of the paper is dedicated to explaining the different ways in minimizing errors that occurs along the supply chain.

- Lean supply chain (Qrunfleh, S. and Tarafdar, M. (2013)) → Eliminating Waste, Involving Everyone, and Continuous Improvements

- Agile supply chain (Qrunfleh, S. and Tarafdar, M. (2013)) → Alertness, Accessibility, Decisiveness, Swiftness, and Flexibility.
- Supplier relationship management (Liao, Y., Hong, P. and Rao, S. (2010))
- Total quality management → Customer-focused, Total employee involvement, Process-centered, Integrated system, Strategic and systematic approach, Continual improvement, Fact-based decision making, Communications
- Vendor Managed Inventory (Disney, S.M. and Towill, D.R. (2003c))
- Big Data (Artificial Intelligence)

## METHODOLOGY

This study is dedicated to apply theories into real life situations and businesses based on a small to medium enterprise capacity and capability. The research is highly qualitative supported by primary and secondary data followed by a case study provided by a Chief Executive Officer (CEO) of a Blablabla company based on one of his current subsidiary in Jakarta, Indonesia. This provides a reflection of the reality in running a business and how a small to medium enterprise can improve the dynamics of the supply chain with limited access to adequate resources. The data collection method is a literature study on recent journals, articles, books, and interviews with a Chief Executive Officer. Most of the authors of the journals were, or still currently is, practitioners in the field.

## FINDINGS AND ARGUMENT

A study done by Taylor (1999, 2000) concluded that a supply variability is a possible cause of the bullwhip effect. Supply variability meant by Taylor here is the operational input done by the company. This includes machine reliability, quality management, and other inputs that triggers a delay and/or require replacements and maintenance. These unreliable output produces fluctuation problems, a replacement order in period 1 will affect the production of period 2 where the output will be exaggerated to make up for the losses in period 1. This false sense of increase will be carried out down the supply chain and gets amplified whenever another action by other members in the supply chain is taken in response towards this fluctuation.

The first question towards an error that occurs in the supply chain is to ask whether or not their forecast is accurate. A supply chain manager can review and change their forecasting methods in any possible way and still find that the bullwhip effect is not avoidable. Studies shown by Disney and Towill (2003a; Dejonckheere *et al.*, 2003) stated that forecasting methods of any kind will not avoid bullwhip effect where order-up-to replenishment policy is instituted or where safety stock policy is applied. A safety stock policy or order-up-to replenishment policy exists to avoid variance amplification and to succeed in accomplishing a smoother ordering pattern.

Lee *et al.* (1997) mentioned about 4 causes of bullwhip effect; demand forecast updating, order batching, price fluctuation, and rationing & shortage gaming. The problem here lies in the rational reaction towards uncertain information that arises from the market, government, internal operations, and external communication.

- Demand Forecast Updating
- Order Batching
- Price Fluctuation
- Rationing and Shortage Gaming

## CONCLUSIONS

There are lots of tools that a company can use to curb the bullwhip effect but every situation have different solutions. Situations varies from the size of a company, what industry is the company in, or other elements that is unique in their own sense. What is sure is that there is an ideal theory of what a health supply chain system should operate and there are different ways to achieve it. Out of all the theories discussed in this paper, Total Quality Management (TQM) provides the most complete way that small medium enterprises can do while also preparing for the next step. In terms of small to medium enterprises where a huge capital is not available to harness big data and high technology into their system, there are steps to take and follow using the Total Quality Management (TQM) model. By following TQM model, the small medium enterprise not only improves their current dynamics but lays a solid foundation for the future where, when a huge capital is available, can integrate and invest in expensive methods to improve their supply chain.

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