



The Effects of Postponement Strategy on Company KPI's And An Industry Application

Lütfi Apilioğulları¹

Abstract

Customer expectations in today's world are changing at an incredible speed. These expectations lead to the creation of new products and naturally an increase in product variety. As a result, the high volume / low mix concept of the past replaces with the high mix / low volume concept.

On the other hand, by each passing day in today's globalized world, more companies continue their search for new customers in foreign markets. However, management processes are required in order to be able to enter into those markets and to be permanent, while particularly being competitive in terms of cost and, at the same time, without compromising the customer service level. Problems, such as inventory turnover, lead-time, the cost of logistics, are always waiting for them to be solved in this situation.

Postponement strategy is an approach in case of supply chain management that allows you to manage operational processes, despite the variety of products, without compromising the service level. Today there are many successful examples of it.

In this study, the effect of the operational processes in which postponement strategies being adapted to a company in the paint industry has been studied.

Keywords: Postponement Strategy, Lean Supply Chain, SCM

Introduction

We live in incredibly changed world. The main factors that stimulate this change are customer's requests and expectations. The change in customer's requests and expectations cause rising new products and old low volume/high mix concept gives place to new high mix/ low volume concept [1]. Now, customers substantially decide the products' properties, colors, and functions, in short, what products produce. In other words, customers want very different, specific, customized special products [2].

Other result of this change is that lifetime of product becomes shorter day by day; increasing product variety can cause uncertainties and changes in customers' decision process till the last moment. Increasing conditions of competition and ability of doing similar products by almost everybody show the competition is the highest priority in speed.

So, new current state is as follows.

- Customers are requested more variety and customized products,
- Speed is emerging as the ultimate competitive weapon (Business Week, 2006)[2].

With this factors, continuously increased cost pressure is became compulsory the change of production / logistics methods. Make to stock method is closed in order to both produce many different types of product competitively, and transfer without sacrificing customers' service level. Motionless products are found in the stocks of companies that prefer this method, stock turnover rates decrease, cash flows are become lower and as a result of these, company considerably lose their competition advantages.

¹ Lütfi Apilioğulları, Maltepe University, Department of International Trade and Logistics Management, Ph.D. Program in Logistics and Supply Chain Management, Istanbul, Turkey, lutfi.apiliogullari@leanofis.com



Companies, which realized negative effects of this situation are now adopted a new demand-driven manufacturing philosophy as new concept and they are, waited a clear signal from the customer to move to the next stage in each stage. Postponement strategy is emerged as a process that is applied successfully in many sectors and carried decision-making process to the final stage required for receiving final version of the product [2].

In this study, how vary with company operational KPI's as a result of implementation the postponement principles of lean supply chain to a business in manufacturing sector and the effect of this variability on expenses is indicated with case study method. The success of application is evaluated in comparison of KPI indicators of current state and new KPI indicators occur as a result of new state of process.

Background

The term postponement refers to delayed decision-making about a product. It is beneficial to delay commitment to product-specific characteristics as late as possible in order to avoid a mismatch between orders and inventory on hand[2]. The concept of postponing product differentiation beyond manufacturing has been discussed for over 50 years. Alderson (1950) appears to be the first who coined the term postponement in marketing literature[5].

Postponement strategy could be applied starting from design stage to shipment stage. Basically there are two type of postponement strategy. 1) Production postponement, 2) Logistics postponement. In production stage the semi-finished products or standard products are kept in stock area that called vanilla box and differentiated (manufactured or assembled) as soon as order received. Logistics postponement strategy is also postponing some activities in logistics processes such as packaging, labeling and shipment activities of the products until order received from the customer.

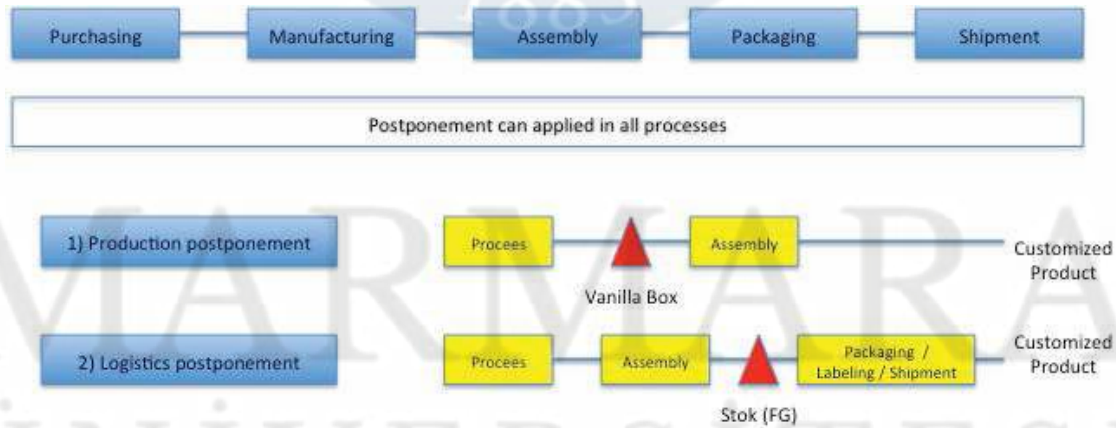


Figure 1: Postponement types

Until now, much application/ study was carried out about postponement in industry and proven the impact of this process on operational performance.

- Dell computer Manufacturer Company has applied product diversification process according to customer requirements successfully and has achieved a significant competitive advantage. With this method, products are waiting semi-finished stocks called vanilla box until a certain stage (standard). According to the properties of order came from customer, products are received the final form and shipped. In addition to this, Dell Company holds less price of the most preferred products than the price of special products by holding a finished product stocks for the most preferred products. In this way, company both make deliveries from stocks by directing customers to the most preferred products and answer the customers who requests specific products with postponement strategy.

- Gillette Company has made another application of postponement strategy by sending standard products as bulk, performing at distribution center outside the factory in line with customer demands.
- Whirlpool Company has provided savings in total cost of inventory both the logistics and supply chain by making postponement application by sending products, which was sold by dealers from directly its own distribution center.

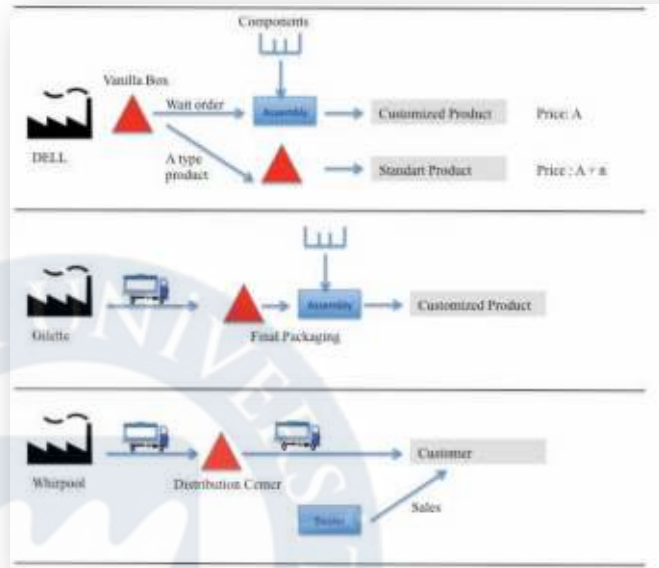


Figure 2: Some examples from industry

Theoretical supports have come to similar studies in the academic sense. Riets (2006) did researches on the postponement strategies can be applied in both manufacturing and logistics sector and mentioned that this process improves lead time, stock turnover rate performance in company performance. Nginiated (2010) mentioned in doctorate study that postponement process is an important tool during pulling down process of companies [7] and again similarly Bulgak (2006) emphasized in studies that postponement process is an effective competition tool [4].

Method and Framework

LSA Company that the study was carried has been operating in paint manufacturing sector. The company has customers both domestically and foreign.

It is utilized from continuous improvement cycle methodology consists of totally five steps for observation, evaluation and analysis process.

- 1) **Current state mapping:** Value stream mapping (VSM) method is used for current state analysis of entire process of selected product family from suppliers to product shipment. VSM is a process that everybody understands by depicting with using standard symbols of all stream (process- materials and knowledge) beginning from suppliers to product shipment for selected product family[10]
- 2) **Future state mapping:** Value stream mapping (VSM) method is used for current state analysis of entire process of selected product family from suppliers to product shipment. VSM is a process that everybody understands by depicting with using standard symbols of all stream (process- materials and information) beginning from suppliers to product shipment for selected product family.
- 3) **Improvement road map:** It is a preparation process of necessary improvement action plans that should be needed to come from current situation to future situation.



Figure 2: Continuous Improvement Cycle



- 4) **Implementation:** It is a process that carrying out kaizen's which specified in improvement road map one-to-one in the field.
- 5) **Check result:** It is a checking whether desired target is achieved or not as a result of kaizen application, planning a new kaizen application if results are far from the target and applying process.

General process:

1. LKS firstly obtain semi-finished products by mixing chemicals that are procured from suppliers at specific ratios (prescriptions) in paint production (phase_1: this part is company's know-how and it's confidential.).
2. Base products are obtained by mixing the obtained semi-finished products with cement which called as filling materials that constitute 60% of product weight in mixers (phase_2).
3. These base products can be used directly by customers as well as different colors of products can be obtained in colorization process by mixing appropriate amount of color pigments (phase_3).
4. Products that colored in colorization process are firstly placed in finished product stocks and then shipped to customers after order receives (phase_4).
5. Orders that are shipped to customers (dealers) are shipped again from there to final customers (phase-5).

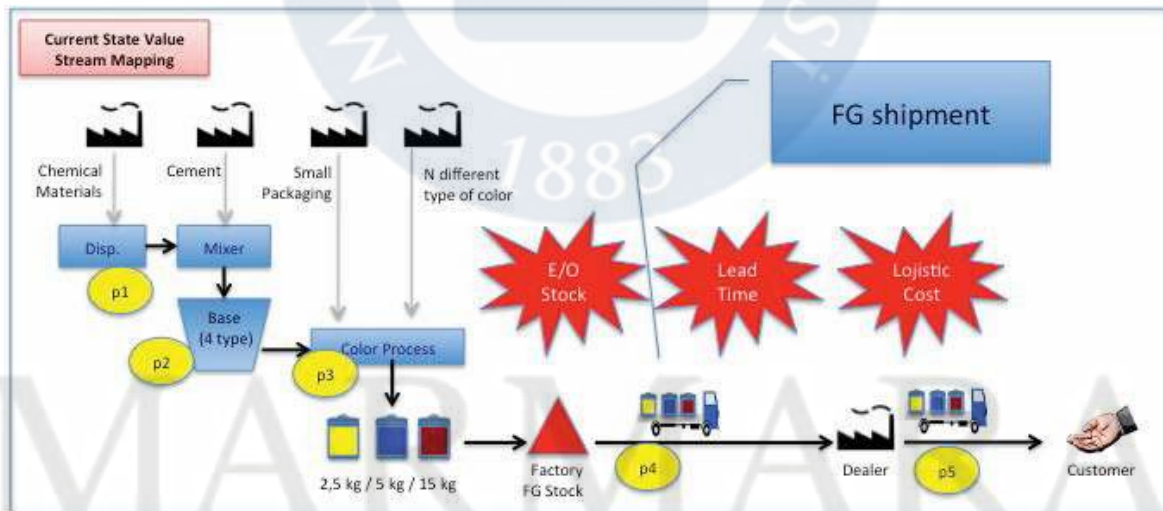


Figure 3: Current state value stream mapping

Company that study was carried has 3 semi-finished products, 4 base products and more than 500 colored SKU. The most general operational difficulties that this sector faced with are the factors like the greater number of colored SKU, inability to control the amount and color variability in customer demand, necessity of preparing and sending products as soon as possible even if the products are very small amount.

In order to overcome these problems, LKS stocks the best selling colors based on the information received from forecasts in finished product stocks and try to meet demands by shipping from stocks when ordering these colors (Option_1: Stock to Shipment). When it come non-stock color order, company tries to respond with shipping from process to needs method by manufacturing from the beginning of the process (Option_2: Manufacturing to Order).

- Being excess/obsolete risks are high at option_1 as a result of inventory costs and very little movement in some products.



- Lead time is longer at option_2. In addition, economic quantities that can be have been identified in semi-finished product / product / colorization processes. Even if demand is less than this level, LKS manufactures the economic production amount that has been identified itself, ships demand amount and remaining amounts are waited in stocks. In such cases, if demand product is a specific color items, remaining amount are waited quite long time and it can be removed to wastage after a time.

In this study, it is investigated that how LKS company ships colorized products both domestic and foreign customers (dealers) with postponement method and how improve the operational efficiency by this means.

Domestic customers: LKS Company has dozens of domestic dealers. Final customer demands come to the dealers and if demand can meet from stocks, products are shipped to customers. However, in absence of the desired product, dealer indents for product by ordering. If colorful product, which is dealer demand, is in stocks, there is direct shipping, otherwise final customer expectations are tried to meet with shipping from process. Some disadvantages ensue like late deliveries, loss of customer and increase of inventory costs.

Product in a different colors that customer wants is obtained in colorization process. So, up to this process, other processes are same, after this step product differentiates by undergoing color change. Colorization process is carried out in bigger equipment's and higher lot amounts in industrial sense. However, final customer's expectations are much smaller quantities of colorful products (2.5 kg / 5 kg / 15 kg).

In this context, a mechanism / system were installed to dealers which called as color bank (phase_3 process were transferred to the dealers side.). The most fundamental feature of this system is making industrial high amount colorization operation doing in LKS factory for much less quantity products in dealer's environment.



Figure 3: Coloring process in dealer

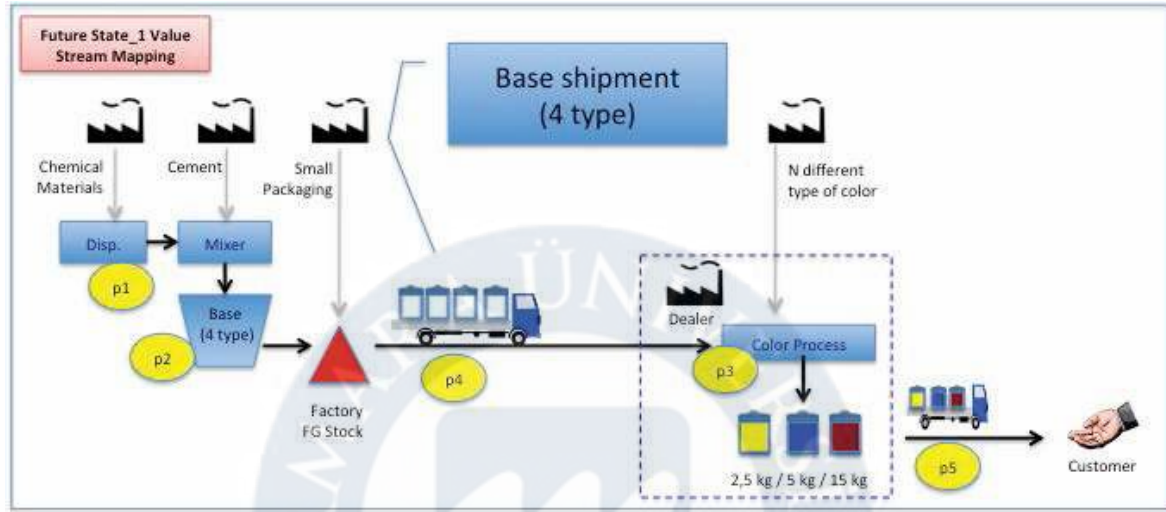


Figure 4: Future state_1 (postponement of coloring process)

So, dealers take four different products in small baskets (2,5 kg $\rightarrow$ 15 kg) instead of colorful products from LKS and stocks these four fundamental products in varying amounts. If the customers ask how much quantity of the product from which color, it is taken from inventory, colorized with color bank and given to the customer. Compared with old system, dealers will be started to pick up only the coloring pigments from suppliers.

Foreign customers: LKS Company has a main dealers abroad. In addition to domestic dealers, this dealer distributes products that came to it into the sub-dealers in the country and products are reached the final user from there. Similar problems with domestic are experienced here. Hence, establishment of same color bank application was considered as an ideal solution. But, logistics costs have to reduced significantly in order to being competitive.

There is no significant weight of color pigment in product. However, filling material, cement, represents 60% of average product weight. Even if there is color bank application, both products have to be sent small buckets and filling materials were transported in product abroad during transportation. The most critical process of paint production is preparing semi-finished products, mixing step of chemical extent of specific prescriptions. These should be kept confidential and not shared with any terms. However, after this process, adding filling material, cement, to semi-finished product with obtained previous process is not very difficult step. Also, filling material (cement) is a material that can be found throughout of the world.

In this context, LKS decided to make the process of adding filling material that provides differentiation during production process in abroad customer. In this way it was decided to send semi-finished product (four type product) in larger buckets (IBS barrel) rather than small buckets. The required mixer mechanism was made and sent to the dealer (phase_2 process was transferred to the dealer's side). Manufacturing finished product from semi-finished product and producing colorful product from finished product was transferred to the dealer's side by establishing color bank continued in this arrangement (phase_3 process was transferred to the dealer's side). Thus, filling material (cement) that constitutes 60 units in 100 units finished product was not transferred in vain. Process was managed by sending only 40 unit semi-finished product (chemical specific mix). Likewise, bucket supply process, cement supply process and procurement process of pigment needed for color bank was transferred to dealer's side and LKS started to manage this process with pull system by adding to semi-finished product supermarket

(Finished Goods SM) for this dealer's process.

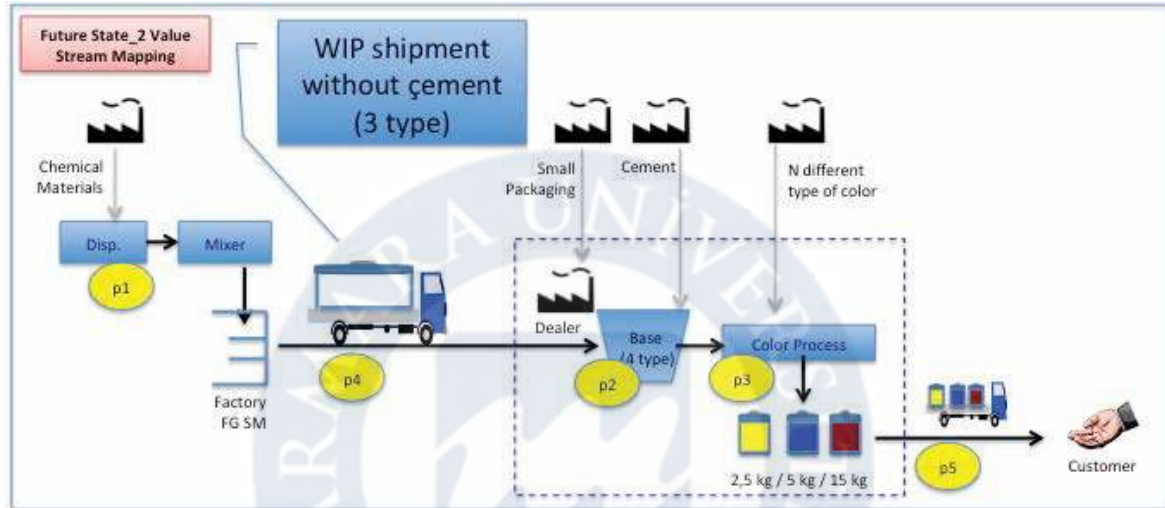


Figure 5: Future state_2 (postponement of making base & coloring process)

Results

On time delivery	: from 75% to 95% (Improved)
Stock turnover	: from 7 to 11 (Improved)
Excess / Obsolete	: 2% to 0.5% (Reduced)
Logistics cost	: 20% (Improved)
Operational efficiency	: OEE, from 75% to 80% (Improved)

Conclusion

In this study, it is examined how postponement strategy effects to the companies operational performance. Production and logistics postponement methods are applied systematically and positive effects on system performance are observed.

It is confirmed that managing processes according to postponement principles effects positively to all supply chain performance in order to produce solutions under the market condition which specially have uncertainty in important issues as stock turnover rate, on time delivery, efficiency.

References

- [1] Apiliogullari, L., 2013, "Operational Excellence / Change Management", System publishing, 1st edition.
- [2] Rietse, S., 2006, Case Studies of Postponement in the Supply Chain, Master of Science in Transportation at the Massachusetts Institute of Technology
- [3] Apiliogullari, L., 2014, "Lean Supply Chain and it's effect on Company Key Performance Indicators and an Industry Applications", XII. Logistic and Supply Chain Congress,
- [4] Apiliogullari, L., 2014, "Tedarik Zinciri Süreçlerinde Toplam Maliyet ve Nakit Akış Hızı Kavramlarının Finansal Sonuçlar Üzerine etkisi", LODER dergisi, s: 20-26
- [5] Bulgak, A., Pawar, A., 2006, Analysis of postponement strategies in supply chains, İstanbul Ticaret Üniversitesi Fen Bilimleri Dergisi Yıl: 5 Sayı: 9 Bahar 2006/1 s. 1-21
- [6] Yao, N., Evers, P., 2005, Supply chain integration in vendor-managed inventory, 2012, Decisions Support Systems 43 (2007) 663-674
- [7] Wang, H., Chen, R., 2006, Case Study on the Application of Postponement Strategy and Managerial Insights, Asia Pacific Management Review (2006) 11(3), 141-153



ICOVACS2015

International Conference on
Value Chain Sustainability
12-13 March 2015

Marmara University,
Institutes Building Conference Hall,
Göztepe Campus

MARMARA ÜNİVERSİTESİ YAYINEVİ

- [8] Ngai et al., T.Chen, R., 2010, Cost reduction through assembly postponement in mass customization, Kent State University Graduate School of Management.
- [9] Hoek, R. 2001, the rediscovery of postponement a literature review and directions for research, Journal of Operations Management 19 (2001) 161–184
- [10] Apiliogullari, L., 2010, “Lean Transformation / The Code of Productivity”, System publishing, 1st edition.



MARMARA
ÜNİVERSİTESİ