

The Effects of Application of Lean Concept in Retail

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ABSTRACT

Lean principles and techniques can be successfully applied in the retail sector. In the retail sector, lean approach improves operational flows. Lean retail encourages manufacturers to produce standard products in accordance with the created (placed) orders from retailers pursuant to the demand of their consumers. Characteristics of the retail market are: strong competition, shorter product life cycle, longer product development time and high sensitivity of demand. In order to be more competitive and profitable today's retailers operate strategically oriented to lower prices and gain exemption from holding unnecessary stocks. Lean retail is an example of best practices of successful operational strategies which management need to accept - to maximize the operating efficiency of the retail process.

KEYWORDS: *Toyota production system, the transformation of retail operations, waste, consumption, distribution, agile supply, efficient consumer response.*

JEL CLASSIFICATION: *D40, L11, L25, L81, M30, M40, M41.*

INTRODUCTION

To become globally competitive modern manufacturing companies apply Toyota Production System (TPS). A pioneer in the application of the concept of lean is the Toyota Motor Corporation. It is designed as a set of tools and methods to eliminate waste and inefficiency in the production system and it is known as the Toyota Production System (TPS). Elements of lean thinking are: defining value → identification of value streams and the removal of waste → organizing around flow → responding to pull through the supply chain → the pursuit of perfection (Piercy & Morgan, 1997). Toyota Production System is now applied not only in the manufacturing industry but in other industries too, including insurance companies, hospitals, airline maintenance organizations, state agencies, the retail industry and many others (Behrouz, 2011).

Similar to the concept of lean manufacturing, the concept of lean retail is known by many names and variations in the literature: lean logistics, lean distribution and lean consumption. Attempt to apply lean concept in retail is recent - it dates from 90s of the last century. In this regard, a number of retailers such as Wall Mart, Tesco and IKEA are well-known.

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1. WHAT IS LEAN RETAIL?

Lean is a modern retail operating strategy which requires maximum efficiency coupled with identification and elimination of waste. It requires simple workflow, eliminating the loss of effort, time, materials and motifs. With acceptance of lean approach managers are able to reduce activities that add no value, directly impact and help prevent the potential problems, and improve global operational flow.

Application of lean techniques, such as the simple organization of work, using "pull" to drive replenishment, removing bottlenecks throughout the supply chain, eliminating wasted effort, wasted time, wasted materials and wasted motion, contributes directly to improving the overall performance in retail. Lean thinking is transforming the traditional way of a retail business to new and more effective. This is shown in Table 1.

Table 1. The influence of lean thinking on the transformation of the retail business

Myths about retail operations	Lean retailing perspectives
It is impossible to provide better customer service without increasing labor costs	"We can improve customer service and frontline employee satisfaction without increasing labor costs"
We cannot predict customer demand, so we must be ready for anything	"Overall demand may be highly variable, but many parts of it are quite predictable"
Product availability can only be improved through increased amounts of inventory on hand	"We can simultaneously reduce inventory levels and out-of-stocks"
We would need a lot of capital to invest because this program may not pay back for years	"We can develop an integrated performance improvement program that delivers results in the same year and is self funding"
By giving stores more control. I lose network-wide consistency and standardization	"We can increase consistency and standardization while empowering local management"

Source: Lean Retailing: *Achieving Breakthroughs in store profitability*, McKinsey & Company

In general, the application of lean approach allows the company to reduce costs, increase efficiency, reduce execution time, reduce waste of all kinds, increase profitability and keep low inventories. It also contributes to customers' satisfaction, improving product quality and increase staff morale.

According to research carried out in practice, quantitatively speaking, the effects of lean thinking in retail are: increased comparable sales by up to 10 percent, reduced labor costs by 10 to 20 percent, reduced inventory by 10 to 30 percent, and stockouts by 20 to 75 percent (Lean Retailing: *Achieving Breakthroughs in-store profitability*, McKinsey & Company). It significantly contributes to improved customer satisfaction. All this, in return, reflects the increased store profitability. For example, the return on equity, as a measure of

profitability, increased by 5 to 10 percent (by: *Competing in a Value-Driven World, North American Retail Practice*, McKinsey & Company). Because of the significant economic impact lean approach is applied in many retail formats (stores), such as grocery stores, specialty, apparel, convenience stores, discount, entertainment, and quick-service restaurants. Figure 1 presents the general benefits of lean retail.

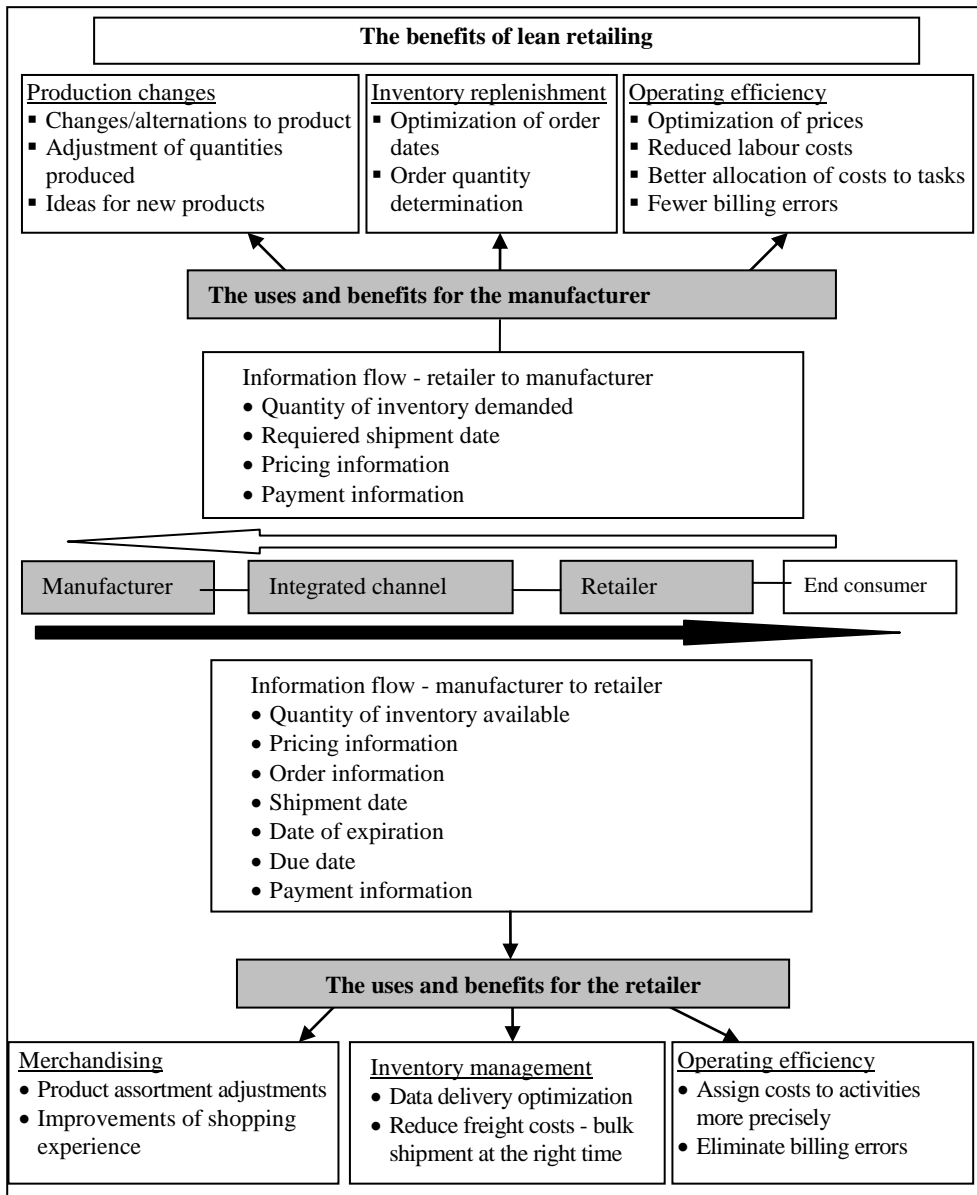


Figure 1. The benefits of lean retail
 Source: McGuckin (2005)

This figure illustrates that retailers and producers themselves gain benefits from the lean retail. Application of lean fundamentally changes the relationship between retailer and supplier. By using the concept of lean retail, global retailer Wal-Mart has established a "new relationship" with suppliers, which allows him to realize significant benefits arising from economies of scale and size. This gives him the basis for the unique retail business model named "daily price reductions".

2. HOW DOES LEAN RETAIL FUNCTION?

The core of lean retail is primarily a commitment to eliminating waste. Similar to the manufacturing sector and following the model of lean approach, the main types of waste in retail are: excess inventory, product defects, unnecessary motion, redundant employees and a waste of time. Managers in retail can use similar tools and principles for identifying all types of waste to improve their operational efficiency. Lean techniques include: (1) simplifying the design of work (organization of individual work process should be such as to provide a high degree of feasibility and possible control, so that it has clear start and finish), (2) the use of withdrawal (pull) to create a replenishment (provided that the supply of goods is fuelled with actual demand of customers, as opposed to forecasts or anticipated demand, so to keep inventory levels low and free space), (3) removing the bottlenecks through the supply chain (by eliminating inefficiency with shorter delivery time, lower transport costs and defects, and improving the flow of goods and operational performance) and (4) elimination of waste of effort, time, materials and movement (by identifying the core business values, with the elimination of excess movement, time, materials and labor used in the process).

The effective implementation of lean approach in retail makes greater cost efficiency, increased worker productivity and less waste of time and effort. This in return significantly affects the improvement of customer satisfaction and store profitability.

Generally speaking, the reduction of unnecessary processes and waste and improving customers' experience is in the heart of modern business today. Lean retail is in line with best practice that contributes to improving productivity and economic performance in the shop. The quality of managing the retail company, store or product category may be, therefore, considered with the help of lean approach.

For example, the study found that there is a similar corporate philosophy of business between Toyota and Seven-Eleven Japan (SEJ). Both companies achieve very good business performance, create a unique corporate philosophy and operate globally around the world. Table 2 gives different viewpoints of manufacturing and retailing towards the concept of lean management.

Table 2. Production and retail overview to lean management

	Lean management		
	Manufacturing	Retailing	
	TPS (Toyota production system)	General model and concept	Seven-Eleven key concept

1	JT (Just in Time)	SCM (Supply chain management)	CDC (Combination distribution center), NDF (Non-deliverable forward)
2	Kanban system	DCM (Demand chain management)	Store initiative ordering
3	Production smoothing	SCM (Supply chain management)	Team merchandising
4	Shortened setup time	SCM (Supply chain management)	Customer focus
5	Shortened lead time	Order-delivery	Dominant strategy
6	Standardization of operations	Franchise system	Store initiative ordering
7	Autonomy	In store merchandising	Individual store management
8	Kaizen (Improvement activities)	In store team meeting	Tanpinkanri (item by item control)

Source: Naruo (2007)

Application of lean system is particularly pronounced in clothing retailers. Figure 2 illustrates the concept of lean in clothing retail and relationship with the supplier.

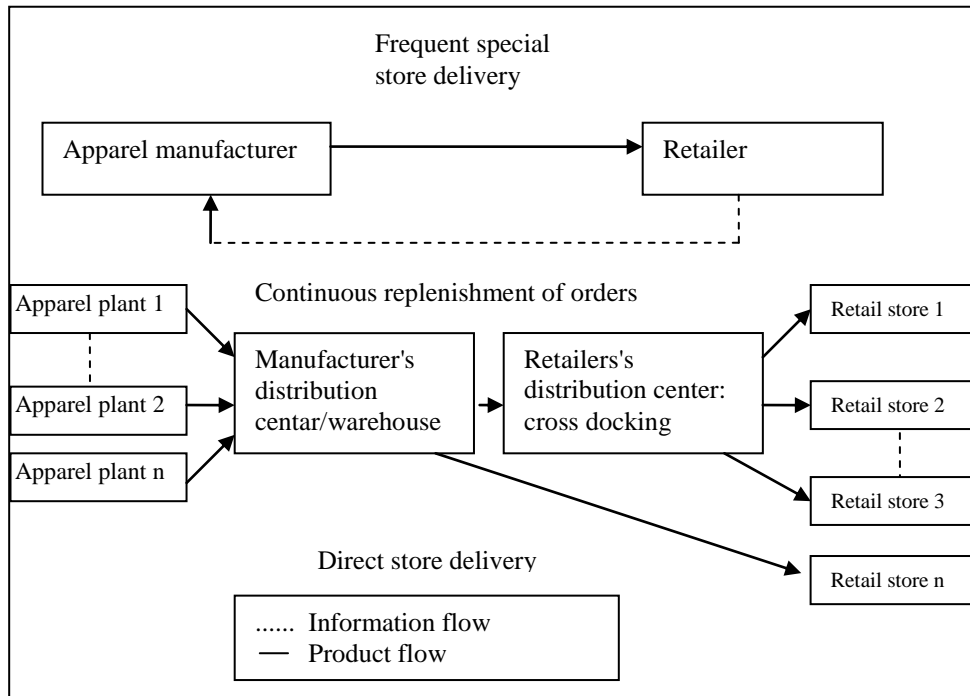


Figure 2. Lean retailing-apparel supplier relations

Source: Abernathy (2000a)

This figure shows that, according to the concept of lean, retail store needs more special supplies - continuous replenishment of retailer's placed orders which are based on information relating the sale collected in real-time by bar code scanning on the retailer's cash register. Data on sales of individual items are aggregated centrally and used for placing orders to suppliers, usually on a weekly basis. Based on lean approach and supported by information and communication technology effects of inventory management result in in-store inventory reduction and increased profitability. By applying the concept of lean, retail develops special relations with suppliers which allow the flow of goods and information to be optimized.

3. EFFICIENT CONSUMER RESPONSE

The main objective of the concept of lean retail is the optimization of not only intra-, but also interorganizational (ie. inter and external) processes. In efficient consumer response (ECR) strategy manufacturers and retailers are trying to optimize product and information flows throughout the value chain, with a starting point - point of sale, and by collecting detailed data on the customer demand. Effective organizational integration of production and retail greatly facilitates the implementation of ICT (information and communication technologies). The development of information on merchandising and logistics (80s and 90s of the last century) has significantly contributed to rationalization and centralization of positive effects.

Optimizing the supply chain means faster response of supply in relation to the actual sale. Introduction of electronic scanner cash registers (mid 80's of the last century) combined with electronic data interchange (EDI) or Internet, provides information on the sale which supply chains forward to manufacturers and their suppliers, altogether contributing to faster reaction related to changes in demand. Bar-coding and electronic tracking, in addition to large investments in rationalization, leads to increased turnover speed in distribution centers and warehouses. Based on the package and bonding product range for one output, we can observe a trend towards the distribution center with no storage space, where the goods are directly re-sorted and packaged in a process known as cross docking.

The concept of efficient consumer response (ECR) introduces not only the optimization of logistics. Data collection via scanners and cash registers provide information about the buyer's behavior (who are the buyers, what, when and where they buy?), which can be used as a base to create marketing strategy for new product development for the target group of customers. Retailers and manufacturers are able therefore to effectively adapt to customers' demand range. Retailers can also successfully use collected data for the systematic development of new products with manufacturers or, in the case of private labels, with their own particular group of retailers.

All in all, electronic data interchange (EDI) and quick response (QR) improve relations between retailers and suppliers, allowing retail prices to be reduced by 10% (Berman, 2010).

4. MANAGING PRODUCT CATEGORIES

Managing product categories adequately links retail and production thus contributing to the improvement of efficiency throughout the value chain and, therefore, overall performance in retail. Managers of product categories in retail companies are responsible for only one product category across the entire value chain, starting with suppliers, or even product design, through logistics and cost planning to final sale. Table 3 shows the effects of inventory management based on lean approach, on the level of individual items.

Table 3. The effects of inventory control in the light of lean retail

	Sales	Production costs	Inventory costs	Average order-fulfillment ratio	Total inventory (week demand)	Profit
1. Minimize stockouts (Single inventory policy)	\$ 1,761	\$ 1,198	\$ 79	97%	18	\$ 485
2. Minimize inventory costs (Single inventory policy)	\$ 1,612	\$ 1,062	\$ 55	89%	13	\$ 494
3. Balance stockout and inventory costs (Single inventory policy)	\$ 1,739	\$ 1,158	\$ 70	95%	16	\$ 512
4. Maximize profits and reduce inventory risk (SKU-level inventory policy)	\$ 1,728	\$ 1,148	\$ 66	95%	15	\$ 515

Note: Dollar amounts are weekly, in thousands
Source: Abernathy (2000b)

Application of inventory policy for individual items is more efficient compared to the compound in the realization of profits. Companies Home Depot, Wal-Mart and many others manage inventory for individual items, thus increasing their profits.

The concept of category management may, however, be in conflict with other management requirements. Problem, in fact, occurs in connection with the purchase of large quantities of the individual product categories in cases when negotiating with manufacturers on terms and price. It, too, occurs in the case of application of policies and strategies of differentiated prices (such as, for example, promotion of special offers) which applies to all not just certain categories of products.

Managing product categories is also incompatible with the management of key customers. Managing key customers is a modern concept of business producers which have been traditionally organized by product and now employ special managers for large customers, who operate in all products for all customers.

In principle, the application of lean in retail contributes to increased profitability. The concept of lean retail is considered to be relevant to the basic products because of its forecasting capabilities and where the application of the "just-in-time" supply chain concept is appropriate. It may, however, adversely affect the industry supply chain because of its dependence on customers, what can result in a lower or reduced level of profitability.

In addition to these fundamental problems, producers and retailers often have different interests what causes the problem of efficient control of the value chain. This can best be seen in the example of the brand or private label controlled by the retailer. In many areas the value chain integration organization is developed. It can be greatly contributed with the

implementation of the concept of lean retail, as well as with the concept of efficient consumer response. In the buyer-driven model (pull not push) retail plays a central role.

5. INFORMATION AND COMMUNICATION TECHNOLOGY

Using new information and communication technologies do not automatically lead to increased integration of network between retailers and manufacturers. Internet market (business to business, B2B) may also increase the number of available sources of supply.

Research in practice identified multiple benefits from the use of RFID technology for retailers. Illustration in Table 4 shows the benefits of applying RFID technology in apparel retailers.

Table 4. Reported RFID benefits to apparel retailers

RFID business benefit	Reported benefit
Reduce inventory management labor	Reduce costs by 50-95%
Improve inventory accuracy	Reduce total inventory by 7-15%
Reduce sales floor staff restocking efforts (not assigned to serving customers)	Reduce sales floor staff by 15-50%
Increased sales	Increase sales by 4-15%
Improve service level from distribution center to store	Reduce service time from distribution center to store by 10-25%
Reduce shrink (due to theft)	Reduce shrink by 10-50%

Source: IDC Retail Insights (2009)

6. LEAN CONSUMPTION

The concept of lean manufacturing transformed production in terms of its maximum efficiency. Now it is the time to apply lean thinking to the consumption process, which is known as lean consumption.

Minimizing customers' time and effort and arranging deliveries exactly when and where they are wanted, allow companies significant benefits. For these reasons, in all companies, including retail, special attention is paid to the efficient customers / consumers relationships management. They are a special "capital" category for them.

7. LEAN DISTRIBUTION: SUPPLY CHAIN MANAGEMENT

Generally, the application of lean principles enables the company to service the customer faster, using less space and inventory, lower transaction costs and with greater accuracy. It, in fact, contributes to improving the company's key measures of efficiency, such as: the percentage of execution of orders, shipping costs, transaction costs of storage and inventory levels.

So, for example, by applying the lean thinking company IKEA has less human effort, less capital investment, shorter time, several factories and stocks are at an acceptable (target) level. All this has positive effect on its business performance.

It is estimated that by applying lean thinking business performance can be improved by 30-50%. This is done by eliminating or minimizing activities that add no value through the entire value stream. It is believed that over 60% of the activities do not add value. Their elimination is a significant resource for improving distribution performance. Productivity

collecting inventory increases by 45-50%. The accuracy of inventories, with the elimination of unnecessary movements is increased by 90% and deliveries to customers by 98% (Coleman, 2006).

In general, lean thinking can be seen as maximizing the relative value of the delivered (in accordance with the customer's perception), with reducing waste (and therefore operating costs). Similarly, the lean distribution can be defined as minimization of waste in the downstream supply chain, so that the right product is available to the customer at the right time and right place (Reichhart & Holweg, 2007). Figure 3 shows the lean logistics in retailing.

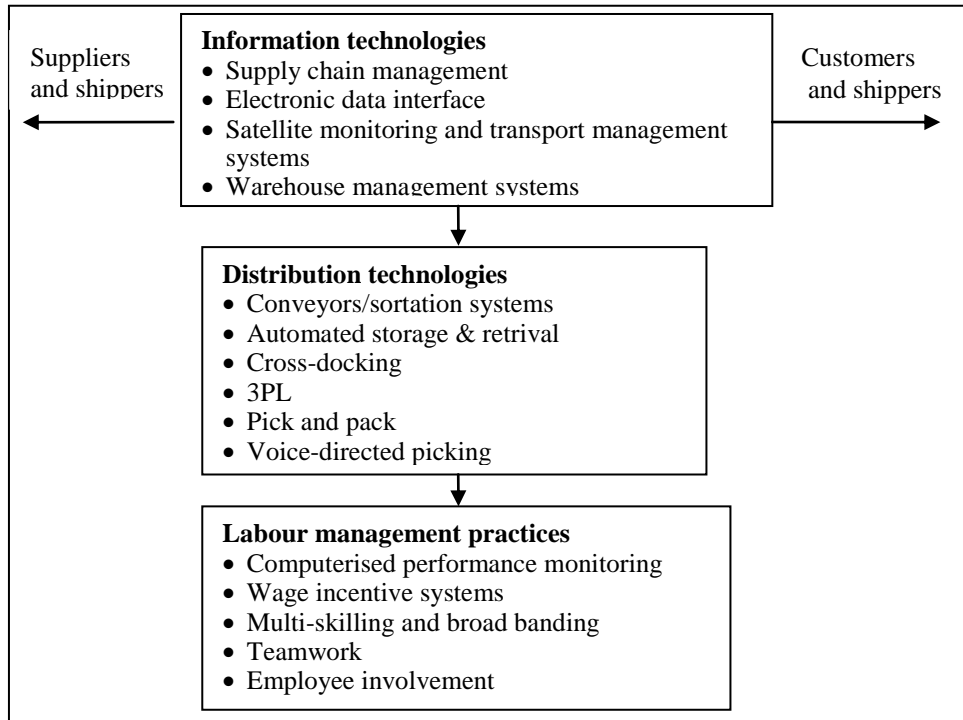


Figure 3. Lean logistics in retailing
 Note: 3PL (*Third Party Logistic*); third parties.
 Source: Wright & Lund (2006)

Lean supply means mapping (determining) the flow and eliminating all types of losses in the supply chain. Research in practice determined that the application of lean / just-in-time (JIT) practices significantly contributes to reducing the execution time of received orders.

There are some differences between lean and agile approaches. In some cases the lean approach does not allow for efficient management of internal processes or external relations. It is better in conditions of high and predictable demand, with some supplies, so that functional products can be created. In the case of low volume, high sensitivity of the supply chain, unpredictable customer's requirements and difficult control of suppliers' capacity and innovation, quick response or agile approach based on product innovation is preferable (Cox & Chicksand, 2005). Table 5 shows the profiles of lean and agile product (ie supply chain).

Table 5. Lean and agile product profiles

Distinguishing attributes	Lean supply	Agile supply
Typical products	Functional products	Innovative products
Marketplace demand	Predictable	Volatile
Product variety	Low	High
Product life cycle	Long	Short
Customers drivers	Cost	Availability
Profit margin	Low	High
Dominant costs	Physical costs	Marketability costs
Stockout penalties	Long-term contractual	Immediate and volatile
Purchasing policy	Buy materials	Assign capacity
Information enrichment	Highly desirable	Obligatory
Forecasting mechanism	Algorithmic	Consultative

Source: Cox & Chicksand (2005)

Application of lean thinking impacts the achievement of cost savings across the entire value chain. For example, research in the UK found that all participants in the value chain of red meat industry generate 2-3% cost reduction (Zokaei & Simons, 2006).

CONCLUSION

In the literature the term lean is defined as long-term philosophy of growth with the generation of value for the customer, society and economy, which is achieved by reducing costs, improving delivery time and quality through total elimination of waste. In recent times, lean thinking is applied in all areas of business, including retail.

In the retail customers' demand is elastic. Retailers need to adapt inventory movements to customer demand. What may help is successful implementation of the concept of lean retail. The concept of lean is a combination of lower retail inventories and more frequent filling in the shop. With lower inventories at the store, retailers will not have a large amount of unsold goods under the terms of a collapse in demand. With frequent filling, store manager does not have to periodically control the "popular" items. Lean retail requires (1) bar codes, which allow retailers to control the sale of each of the ten thousand products in stock, (2) electronic data interchange, a computer system network that allows retailers to quickly and inexpensively communicate with suppliers, and (3) modern distribution center which is a fast channel of goods from suppliers to sales locations.

Basically, the concept of lean retailing is to give quick response to fluctuations in demand rather than holding large stocks. Lean retail enables faster movement of goods from suppliers to sales locations. The application of lean principles, RFID technology and inventory management at the level of individual items significantly contributes to creating value for customers and retailers. The essence of applying five principles of lean retail are the following: 1) if customers expect that products to be supplied are in trend, it is necessary to eliminate obstacles such as extra grip and improve processes that result from poor design diagrams. 2) the pursuit of value system, which consists of identifying and mapping all the steps regarding the movement of goods through the system all the way to the customer; activities that do not add value should be eliminated, 3) execution of the

process flow, in terms of process redesign that will ensure the free flow of products to customers, 4) the withdrawal from customers means that lean performance requires clear understanding of demand and current inventory levels, and that the withdrawal of goods to the store and shelves is based on customers wants, and 5) perfection, which is reflected in the fact that the remaining waste need to be rooted out, and then the same thing again. Ultimately, all this has a positive impact on business performance of the shops and retailers in general.

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