

# PRACTICAL LEAN MANAGEMENT IN A CHAIN OPERATED HYPERMARKET CONCEPT

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| Abstract<br><p>The subject of this Bachelor's thesis is "Applying lean management in a hypermarket concept". The thesis was assigned by Suomen Lähikauppa Oy, and was done as a project in association with Suomen Lähikauppa's employees and management consulting firm McKinsey &amp; Company during 2007 and 2008.</p> <p>Suomen Lähikauppa faces continuous challenges in a growing competitive market which calls for higher profitability and demands greater efficiency. In the project we concentrated on developing and improving the work efficiency of the employees, general store conditions, and campaign actions. This thesis reports the results of this project.</p> <p>The first part of the thesis covers the history of the lean approach as well as the theoretical background to lean thinking and management. The second part covers the different phases of the lean-project. In the first phase of the project, the aim was to research and document all daily activities in a hypermarket. Beginning with watching the goods move from arrival at the hypermarket and ending with them in the consumer's shopping bag. In the second phase the information gathered is analyzed and new efficient work patterns are made to respond to the increased sales/working hours expectations. The third phase deals with expanding the new work patterns and issues arising from that, such as opposition to change.</p> <p>As a result of the project a shop activity handbook which includes the directives to the most efficient operations models in a hypermarket sized shop was born. The handbook also works as an orientation guide when training new employees. This thesis also reports the permanency of the operation models introduced in the handbook, one and a half years after the project ended.</p> |  |  |
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| Tiivistelmä<br><p>Opinnäytetyö käsittelee lean-ajattelumallin soveltamista valtakunnalliseen hypermarket-kokoluokan päivittäistavara-kauppa-ketjuun. Työn on tilannut Suomen Lähikauppa Oy ja se suoritettiin projektityönä yhteistyössä Suomen Lähikaupan työntekijöiden ja konsulttiyhtiö McKinsey &amp; Companyn kanssa vuosien 2007 ja 2008 aikana.</p> <p>Päivittäistavara-kaupan haasteena on jatkuvasti koveneva kilpailu ja sen myötä kasvavat kannattavuus- ja tehokkuus tavoitteet. Projektissa keskityttiin henkilöstön työtehokkuuden, yleisen kauppakuntoisuuden ja kampanjatoiminnan kehittämiseen. Opinnäytetyö raportoi tämän projektin tuloksia.</p> <p>Opinnäytetyön ensimmäisessä osassa käydään läpi lean-ajattelumallin historiaa ja teoreettista näkökulmaa. Toisessa osassa käydään läpi lean-projektin eri vaiheet. Projektin tavoitteena oli ensimmäisessä vaiheessa tutkia ja dokumentoida kaikki hypermarketissa päivittäin tapahtuva toiminta. Käytännössä tämä tarkoitti tavarankuljetuksen eri vaiheita sen vastaanottamisesta asiakkaan ostokassaan. Toisessa vaiheessa havainnot analysoidaan, minkä pohjalta työstetään uudet tehokkaat toimintamallit vastaamaan kasvaneita liikevaihto/työtunti odotuksia. Kolmannessa vaiheessa käsitellään uuden toimintamallin levittämistä ja siihen liittyviä tekijöitä kuten muutosvastarintaa.</p> <p>Projektin tuloksena syntyi myymälätoimintojen käsikirja, mikä sisältää toimintaohjeet tehokkaimpiin mahdollisiin toimintamalleihin hypermarket kokoluokan myymälään. Käsikirja toimii myös perehdyttämisoppaana uusien työntekijöiden koulutuksessa. Opinnäytetyö raportoi myös käsikirjan toimintamallien pysyväisyyttä puolitoistavuotta projektin päättymisen jälkeen.</p> |   |                                       |
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## 1 Lead in to the lean project – Background for lean thesis

In early spring 2007 Jouni Kesseli, the second of the writers of this thesis joined the Tradeka trainee program. The program involved some theoretical points of view that introduced trainee employees to the company and its working methods as well as key performance indicators. Jonatan Semenov, the other author of this thesis, was contacted by Mr Kesseli to join in on a thesis proposal.

At the same time the company was starting a major project to fully update the working methods in all the shop brands it owned. The project dealt with the practical tasks inside a hypermarket and also regenerated new working procedures. That made the project a unique chance to learn how the shops were maintained as well as a chance to participate in creating new working methods and questioning the old ones.

Mr. Kesseli started the project as a project assistant. In the beginning work was more focused on data sourcing. This involved data collection from Tradeka Oy's SAP-system which McKinsey required for their analysis. Mr. Kesseli also organized customer satisfaction surveys that were conducted by a group of Jyväskylä University of Applied Sciences students. As the diagnostics phase went forward more demanding tasks were appointed and in the end of the phase Mr.Kesseli was promoted to head coach. During the laboratory phase Mr.Kesseli worked together with two other head coaches and a project leader as a rigid part of the core project team and finally in the roll-out phase he supervised a team of coaches.

It was definitely a great chance to see how a real project was implemented. The majority of the school assignments were done in projects. Quite soon it was easy to realize that the project working methods did not differentiate much from the ones used in school. Of course everything seemed to be more professional and was done more carefully but most work and assignments were completely the same as in school. It was also interesting to see how McKinsey tried its 5S-system in practice. It was familiar from school but you rarely get a chance to try it out in practice with real consultants in a real working environment.

The project was a multimillion investment from Tradeka. It involved thousands of working hours and involved, more or less, the efforts of each person who worked for Tradeka at that time. In addition the project offered a unique opportunity to create a thesis from a unique topic. It created a chance to learn skills that would normally take several years for a person to experience the day to day life of a hypermarket size daily consumer goods store.

The thesis workload was divided between the writers. Mr Kesseli had a more hands on approach as he was directly working with Tradeka through the whole project. Mr Semenoff had a more theoretical and reporting approach to the thesis, due to not being able to be as involved in all the concrete project steps. This worked out well as different views were given and shared.

## 2 Company presentation

Cooperation Tradeka Corporation is a Finnish cooperative. The co-op was founded in 1917 and currently has over 300 000 members. Through offering competitive services and benefits the cooperative serves its members. The YkkösBonus-loyal customer scheme is one of the services being developed. The products and services offered by the co-op are either fully or partially owned by the cooperative as well as other suppliers who are part of the YkkösBonus-scheme. Members who have paid their cooperative contribution are offered special member benefits. Cooperation Tradeka Corporation fully owns Restel Ltd, which operates in the hotel and restaurant business, and is a minority shareholder of Suomen Lähikauppa Ltd, whose field is the grocery business. (Cooperation Tradeka Corporation, 2008)

### 2.1 Suomen Lähikauppa Ltd

Tradeka Ltd was founded in 2005, when Cooperation Tradeka Corporation's retail outlets joined forces with Wihuri's Ruokamarkkinat Ltd's retail chains. Tradeka Ltd is owned by Cooperative Tradeka Corporation, Wihuri Oy, members of its corporate

management and IK Investment Partners, an international private equity company. On December 28, 2008, Tradeka Ltd changed its name to Suomen Lähikauppa Oy. Currently Suomen Lähikauppa Oy has over 750 retail outlets. These outlets are divided into three categories: Siwa, Valintalo and Euromarket. (Suomen Lähikauppa Oy, 2009)

### 2.1.1 Siwa

The first Siwa was founded in 1981 in Jyväskylä, Finland. Since then Siwa has grown to be the most popular neighborhood shop in Finland. Currently there are nearly 550 Siwa's evenly distributed around Finland. Siwa outlets are easy and fast to shop in. The annual net turn over in 2008 was 619 million EUR.

### 2.1.2 Valintatalo

In 1966 the first Valintatalo grocery shop was opened in Helsinki, Finland. Now Valintatalo has over 180 shops making it the oldest grocery shop chain in Finland. Valintatalo is popular in cities and urban landscapes and has a category from 2500 to 7500 products. In 2008 Valintatalo's annual net turnover was 458 million EUR.

### 2.1.3 Euromarket

Euromarket is a hypermarket chain and thus the largest of the three retail outlets located in selected cities and their growth centers. Currently there are 25 Euromarkets spread around Finland. In 2008 Euromarkets annual net turnover was 315 million EUR.



## 3 Lean management

### 3.1 What is lean?

Lean is a customer focused approach which eradicates operational business problems. It ensures that customers receive their required level of quality, price and delivery whilst maximising an organisation's competitive advantage and shareholder value. It is an integrated system of principles, operating practices and elements that drive the relentless pursuit of perfect customer value creation.

The five main principles of lean thinking are: *value*, *value stream*, *flow*, *pull* and *perfection*. Specifying *value* by specific product, identifying the *value stream* for each product, make value *flow* without interruptions, let the customer *pull* value from the producer and pursue *perfection* (Womack & Jones, Lean Thinking versus Muda, 2003).

For many, Lean is the set of "tools" that assist in the identification and steady elimination of waste (*muda*). As waste is eliminated quality improves while production time and cost are reduced. Examples of such "tools" are Value Stream Mapping, Five S, Kanban (pull systems), and poka-yoke (error-proofing) (Wikipedia, 2009). All lean activities aim at continuous improvement and ultimate perfection as illustrated by the figure below.

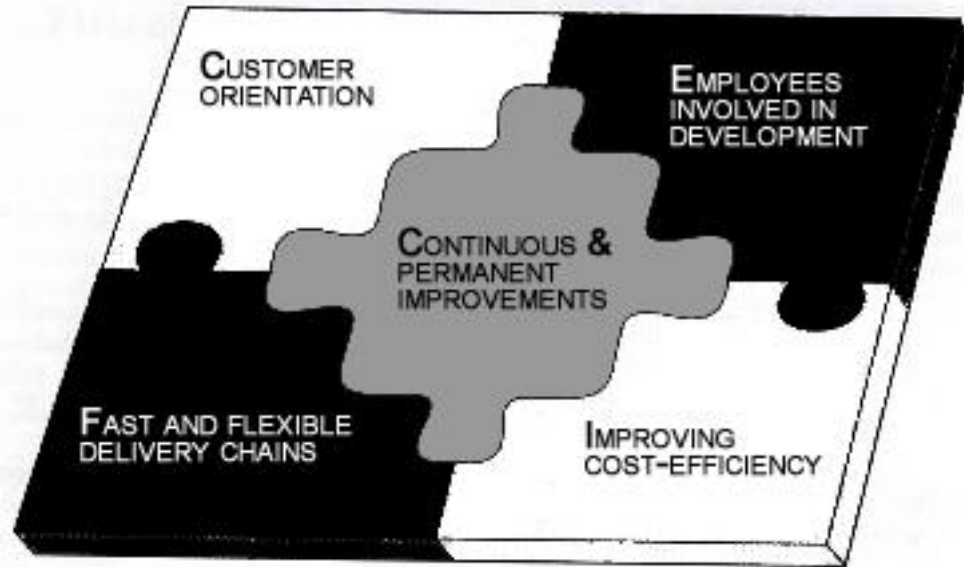


FIGURE 1. The lean puzzle. (Kajaste & Liukko, 1994, 13)

### 3.2 History of lean management

The process to discover lean management started in the late 18<sup>th</sup> century when several individuals started developing interchangeable parts, mainly for firearms at that time. This first led to machines able to shape metal and thus mass-produce other complex machines with moving parts (guns in this case.) During the next 100 years manufacturers primarily concerned themselves with individual technologies. Engineering techniques developed, modern machine tools were perfected and new large scale processes were invented. During these times little attention was paid to what happened between processes or how the process chain worked as a whole. Each employee's task was viewed as an individual task instead of looking at the large scale view.

This all began to change in the late 1890's as Frederick W. Taylor started monitoring individual workers and work methods. The result of his studies was the Time Study and standardized work and this led to the invention of Scientific Management. His concept of applying science to management was valid but Taylor ignored the behavioral aspect. Frank and Lillian Gilbreth added onto Taylor's ideas. Frank came up with Motion Study and Process Charting (also known as Flow Charting) while his wife

Lillian added psychology into the mix by studying worker motivation and how attitudes affected the outcome of the process.

In the early 1900's the first assembly line was invented by Henry Ford and a group of his employees. They took all the elements of a manufacturing system - people, machines, tooling, and products - and arranged them in a continuous system for manufacturing the Model T automobile. Although the system was effective there were limitations with Ford's production method. Model changes, different options and colors were not in line with Ford's plans. At the same time Alfred P. at General Motors took a more pragmatic approach. He developed business and manufacturing strategies for managing very large enterprises and dealing with variety. Thus by the mid 1930's GM had surpassed Ford in domination of the automotive market.

The invention of Ford's methods had a big impact on the Allies winning World War II. After the war Japanese industrialists became interested in the production methods behind the Allied victory, especially those of Ford. At Toyota Motor Company, Taiichi Ohno and Shigeo Shingo began to incorporate Ford production and other techniques into an approach called the Toyota Production System (TPS) or Just In Time (JIT). The people at Toyota realized that Ford's methods, although effective, had much room for improvement, especially in regard to how employees were treated. It was discovered that the employees had much more to contribute than only their muscle. Also, another key finding was realizing the importance of product variety. Shingo took on the problem of changeover and setup. By reducing setups to minutes and seconds it allowed the production of small batches and lead to an almost continuous flow as in the original Ford concept. But Toyota's system introduced a flexibility that Ford's system did not have.

Toyota's development of its processes happened between 1949 and 1975. It spread to some extent to other Japanese companies. Once the improvements in quality and productivity became visible to the rest of the world, American executives traveled to Japan to study it. But early adaptations failed due to the fact that few understood the underlying principles in the methods and they did not implement the method into the complete system.

By the 1980's some American manufacturers, such as Omark Industries and General Electric, were achieving success. Consultants took up the campaign and acronyms sprouted like weeds: World Class Manufacturing (WCM), Stockless Production, Continuous Flow Manufacturing (CFM), and many other names all referred to systems that were, essentially, Toyota Production.

In 1990 a book was written by James Womack, called "The Machine That Changed The World". The book described the history of automobile manufacturing combined with a study of Japanese, American and European automotive plants. In this book the phrase Lean Manufacturing was first mentioned. (Strategos, 2009)

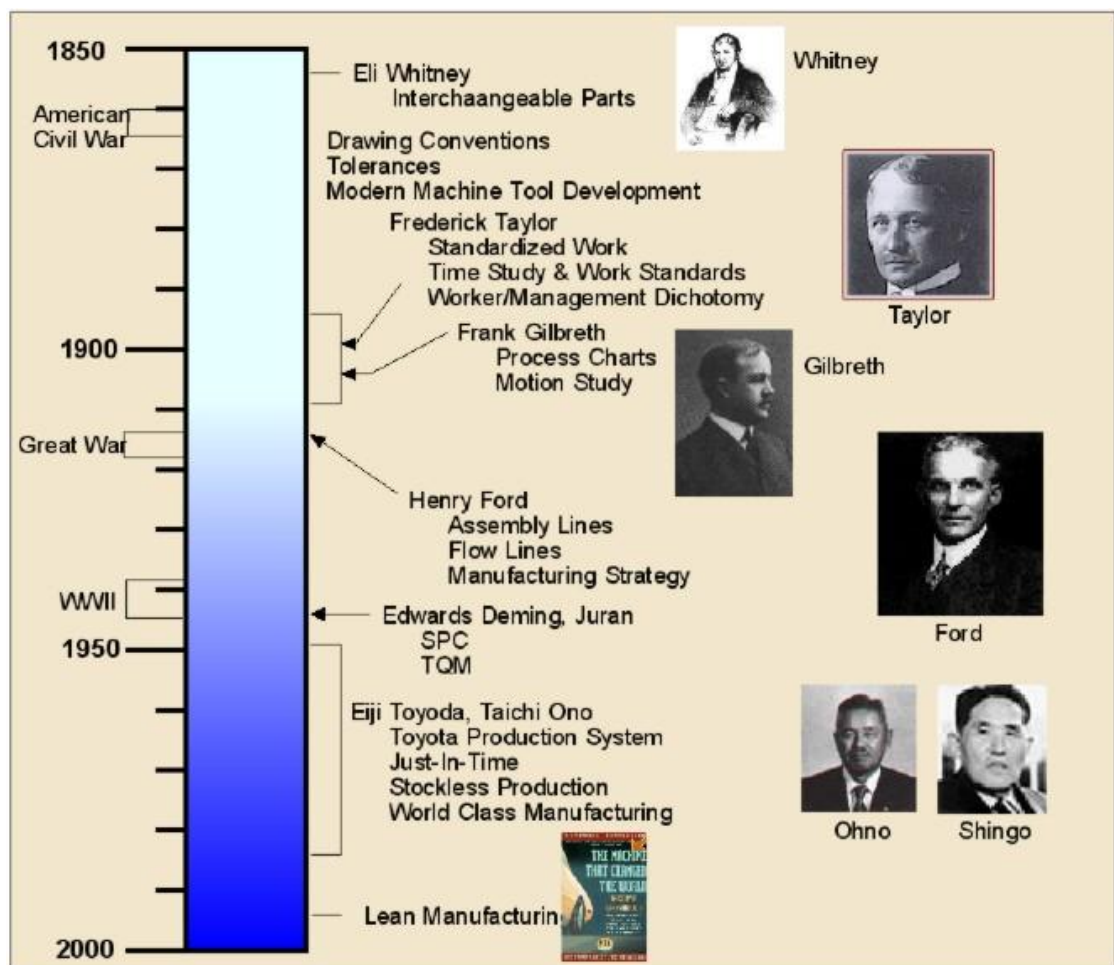


FIGURE 2. History timeline for lean manufacturing (Strategos Inc, 2009).

### 3.3 Lean principles

As mentioned before the five lean principles are: value, value stream, flow, pull, and perfection. By combining all of the principles one yields the best results. Accordingly, the Lean Enterprise Institute (Lean Enterprise Institute, 2009) states a five-step thought process for guiding the implementation of lean techniques:

1. Specify the value of the product family from the end customer's viewpoint
2. Identify all the steps in the value stream that do not create additional value to the product family and eliminate them
3. Have the value-creating steps happen in a continuous movement so that the product will flow smoothly toward the customer.
4. Let the customers pull value from the next upstream activity
5. As value is becomes specified, value streams identified, wasted steps eliminated, and flow and pull are introduced, start the process all over again and continue repeating it until perfection is met wherein waste is completely eliminated and perfect value is created.



FIGURE 3. The five steps to implement lean principles (Lean Enterprise Institute, 2009).

### 3.3.1 Value

Value is a very subjective term, it is very case dependant. It can be hard to correctly define value. Merriam-Webster Online Dictionary defines value as: "a fair return or equivalent in goods, services, or money for something exchanged".

Every company strives to give good value on its products. But they often fail as companies tend to stick to their old familiar routines, and customers often don't know to ask more. Once the providers or customers do decide to rethink value, they often end up using the same old formulas - lowered costs, customization through increased product variety, instant delivery – rather than together analyzing value and rethinking old definitions to see what is needed.

In a lean supply chain customers define the value of products. Through value-adding activities products transform closer to what the customer actually wants. Any activity that does not add value is considered waste and should be removed.

### 3.3.2 Value stream

The second lean principle is the value stream. Gemba Research LLC (2007) defines it so: "A value stream is a series of all actions required to fulfill a customer's request, both value added and not. A value stream contains a product or a family of products that have similar material and information flows." Intermediate goods, services and information can be both used and produced during the process.

Historically management has mainly focused its attention on managing aggregates such as processes, departments, and firms, thus overseeing multiple products simultaneously. Lean management aims at managing whole value streams for specific goods and services (Womack & Jones, Lean Thinking versus Muda, 2003).

According to Womack & Jones, the first step is to create a value stream "map" which identifies every action required to design, order, and make a specific product. After

identifying all the variables the actions are sorted into three categories: (1) actions that actually create value perceived by the customer; (2) actions that add no value but are currently required by the product development, order filling, or production systems and thus cannot be eliminated yet; and (3) actions that don't create value perceived by the customer and thus can be eliminated immediately. Once the third category has been removed, work can be started on the remaining non-value-adding steps through the use of the other three lean techniques: flow, pull and perfection.

### 3.3.3 Flow

Flow comes into play after value is defined and the entire value stream has been identified. It can be defined as the act of flowing or streaming; continuous progression. Liker and Meier (2005, 80) define flow more accurately as a process in which products that go through the processing steps in a continuous movement with the least waiting time, and the shortest distance traveled between these steps, are produced with the highest efficiency. By eliminating the waste inside and between steps in the process we improve flow.

According to Jones and Womack (2003) to make value flow, we must focus on the actual object, which contains the design, order, and the product itself, and follow the whole process from start to finish. Before the first step is possible, we must ignore the traditional boundaries of jobs, careers, functions, and firms. Jones and Womack (2003) also mention that once the traditional boundaries are removed (by completing the second step) we can form a lean enterprise by removing all barriers to the continuous flow of the specific product or product family.

The third step is to analyze specific work practices and tools to eliminate backflow, scrap and stoppages of all sorts. By eliminating steps that only create waste, the design, order, and production of a specific product can proceed continuously. All three steps must be taken together to have proper results (Jones & Womack, 2003, 52).

### 3.3.4 Pull

In simplest terms, pull means that no single upstream activity should produce a good or service until the customer downstream demands it (Jones & Womack, 2003, 67). It is response to a customer's rate of demand i.e. the actual customer demand - that drives the supply chain. Pull is closely associated with Just-in-time (JIT), in that without pull or flow there cannot be an effective JIT-system.

As with all lean techniques, pull also relies a great deal on the customer by having the customer pull value from the next upstream activity. Based on a supply chain view from downstream to upstream activities where nothing is produced by the upstream supplier until the downstream customer signals a need.

### 3.3.5 Perfection

Perfection is the last of the lean principles. Only by implementing all the previous principles can perfection be achieved. There are, according to Womack & Jones (2003, 90 – 91), two ways leading to perfection, the incremental path, and the radical path.

The incremental path is the more traditional approach in lean enterprises. Lean processes are continuously repeated to minimize waste, improve operations. Even after initial results are shown, the process is repeated. Often companies stop focusing on further improvements after the first positive results are shown. To really be lean the process should never stop; the improvement process should be a continuous operation, gaining better and better results until perfection, is achieved.

An alternative to the incremental path is the radical path to perfection. Womack & Jones (2003, 91) mention that the radical path involves all firms from start to finish versus the incremental path where one firm is involved. The radical path is best illustrated through example. Glassmaking for automotive industry will be used as Womack & Jones (2003, 91 – 93) used it well to explain the thinking behind the radical approach.



Manufacturing of fixed glass for cars is quite similar all over the world. The process has four steps, each involving its own company performing its particular step.

1. glass float: sheets of glass are made, usually large batches with long storing periods
2. glass fabrication: cutting and molding the glass to shapes to suit cars. Large batches and long storage times are common.
3. glass encapsulation: the glass gets its outer rubber/plastic seal. Additional storage time is added
4. glass installation: the ready glass is installed in the car.

All the steps involved could be incrementally improved by each company, which would lead to less excess production, and shorter storage times. But due to all plants being far from each other transportation needlessly wastes much time. Also, quality problems causing high scrap levels are harder to address because of the time lags between each step of the process, where problems with the previous step would most likely be discovered (Womack & Jones, 2003, 91 – 93.)

Taking the radical path in this situation would recommend radical actions. These steps would include rightsizing the glass float for specific amounts needed by a customer, thus reducing batch sizes. The first three steps should be situated next to each other to maximize flow between the workstations, and the final automotive plant should be located next to this whole activity so that the pull from the plant could be answered immediately. (Womack & Jones, 91 – 93.)

To make all this possible, all four involved firms would, as Womack & Jones (2003, 93) state it, “need to cooperate in changing their methods by forming a lean enterprise for this product.” If a lean enterprise were formed, the companies involved would need to rethink their whole value stream, which would lead to more radical reconfigurations.

Most companies who choose to pursue lean ways choose the incremental path, as it is much easier to follow. The key is to keep the process alive, and repetitive. The drawback is that only your company is involved in the lean process, thus minimizing waste in only your activities, leaving your partners etc. out of the process. The radical

path takes a bigger leap towards the pursue of perfection. By forming a lean enterprise with companies in your industry, and your partners, you are able to rethink the whole value stream, and reduce waste in the whole process, involving the whole chain of companies involved in manufacturing a certain product.

### 3.4 Muda

Before going into more detail with the five principles we have to cover the term *muda*. Muda is a Japanese word and means “waste,” specifically any human activity which absorbs resources but creates no value (Womack & Jones, 2003).

#### 3.4.1 Eight types of waste

According to Liker and Meier (2005) there are eight major types of non-value-adding activities in business or manufacturing processes identified, which will be described below. These can be applied to product development, order taking, and the office, not just to a production line. “Whenever any type of waste is found in an operation, it is a sign that unnecessary cost is being incurred.” (Drew, McCallum, & Roggenhofer, 2004)

##### Overproduction

Items are produced earlier or in larger quantities than need by the customer. Overproduction also generates other waste, such as storage, overstaffing, and transportation costs because of excess inventory. Inventory can be a physical inventory or a string of information. (Liker & Meier, 2005)

##### Waiting (time on hand)

Workers are involved in unproductive actions such as serving as watch persons for an automated machine, or just waiting for the next processing step or tool, supply, part, etc. Workers who have no work because of running out of stock, lot processing delays, equipment downtime, and capacity restrains. (Liker & Meier, 2005)

#### Transportation or conveyance

Work in process being moved around from place to place in a process, even if it is only a short distance. Having to needlessly move materials, parts, or finished goods between processes or into or out of storage. (Liker & Meier, 2005)

#### Over processing or incorrect processing

Taking unnecessary steps during the process of parts. Poor tool and product design lead to inefficient processing and cause unnecessary motion and produce defects.

Waste is also generated when providing higher quality products than required. Extra "work" can be done to fill excess time rather than spend it waiting. (Liker & Meier, 2005)

#### Excess inventory

An excess of raw material, work in progress, or finished goods leads to longer lead time, obsolescence, damaged goods, storage and transportation costs, and delay.

Also, extra inventory hides problems such as late deliveries from suppliers, defects, equipment downtime, and production imbalances. (Liker & Meier, 2005)

#### Unnecessary movement

Any kind of movement employees have to perform during the course of their work other than adding value to the part, such as searching for, reaching for, or stacking equipment, etc. Unnecessary walking is also a waste. (Liker & Meier, 2005)

#### Defects

The production of defective parts or correcting them is waste. Wasteful handling, time and effort are caused by the repairing of rework, scrap, replacement production. (Liker & Meier, 2005)

#### Unused employee creativity

By not listening to or engaging your employees one loses time, ideas, skills, improvements, and learning opportunities. (Liker & Meier, 2005)

#### Waste in general

Overproduction is considered the primary waste, since it causes most of the other wastes. "Producing earlier or more than the customer wants by any operation in the manufacturing process necessarily leads to a buildup of inventory somewhere down-

stream.” (Liker & Meier, 2005) Due to overproduction the material ends up just sitting around waiting for the next step to be processed in.

The first seven wastes have a big impact on the eighth waste, unused employee creativity. The first wastes all hide problems, which lead to team members not needing to think. Reducing waste exposes problems and forces team members to use their creativity and thinking to solve problems. (Liker & Meier, 2005)

## 4 5S

### 4.1 OVERVIEW

Five S (5S) is a methodology to organize the workplace based on a list of five Japanese words, which transliterated and translated into English, start with the letter S. The 5S is more than just a method, it is a philosophy which aims to improve efficiency by eliminating waste, improving flow and reducing process unevenness through organizing and managing the workspace and work flow.

Like most lean methods and ideologies the 5S was originally created by Toyota in the 1950's as a part of the Toyota Production System (TPS). The original five Japanese words on which the method stands are: Seiri, Seiton, Seiso, Seiketsu, and Shitsuke. There are many different English counterparts used for these words, and one option is: Sort, Set, Shine, Standardize, and Sustain. Whatever substitutes are used, the bottom-line is that the five S's should as Borris (2005, 154) says: “combine to make a five-step formal program that introduces, implements, and maintains a clean, safe, clutter-free, and efficient site”.



FIGURE 4. Cycle of 5S (Lean Search Marketing, 2008).

As all lean activities, the 5S pillars require everyone's continuous participation, from the highest management to the lowest workers to be successfully implemented. Without everyone's participation the improvements cannot be sustained and thus development of the company suffers. As mentioned above, 5S is more than just a set of actions; it is a philosophy that aims at continuous improvement and the change of traditional attitudes.

## 4.2 Sort

The first stage of 5S is to sort and organize the work area, leaving only the necessary tools and material needed and removing all unneeded items. The sorting process can be divided into four steps:

1. Define what is needed
2. Define what is not needed
3. Disposition the items
4. Take action: move out unneeded items and move in needed ones.

The first step is to define what is needed. When considering what is needed in the work area you have to remember to look past the core equipment and tools used, and also consider the materials, supplies, and the paperwork. At this point it is also good to evaluate the proper quantities of items needed at the work area. Defining the needed items can't be done effectively by one person, but instead a team representing the people who work in the area should be used.

Once all needed items have been identified by the team focus is turned on all the items still in the work area. Items that are not needed to make the product, support the operation of the equipment, or for safety reasons, should be removed from the direct work area.

After all unneeded items have been identified it is time to disposition them and define a storage place for the items. All items to be removed are tagged using a standardized set of usage-based guidelines. Data should be collected on the frequency of items used to get accurate information. The items are dispositioned based on their frequency; the less frequently an item is used the farther from the work area it can be stored.

Once items are dispositioned the work area can be cleared and all the tagged items moved to a temporary holding area. Now others who weren't on the team can examine the items and either confirm that they don't need to be kept in the work area, or discuss why an item is needed there. (Resource Engineering, Inc, 2009)

The sort phase can be applied to all work areas, manufacturing departments, service processes, and offices. Taking the steps mentioned above the work area becomes a more effective, clean, and safe environment.

### 4.3 Set in order

The second phase in the 5S scheme is set in order, which should be run in parallel with the first phase. Set in order which can be also called designating locations is about organization and orderliness. The key to set in order is that there is a place for everything and everything must be in its place

After all the items in the work place have been sorted to their needed or unneeded categories it is time to designate specific locations for everything. Designating specific locations for items and objects saves time and effort. Workers can easily see if everything is correctly placed or misplaced, and if more supplies, materials, or tools need to be ordered.

Designing the specific locations can be an easy task, but often it requires additional information. To get the most efficient result, it is good to study the location, type of storage, and labeling used to develop a storage system which will yield the most effective and productive results. According to Quality Training Portal (2009) an effective storage is based on "a combination of factors such as the frequency of use, the sequence of use, and the bulk or cubic feet occupied by the item stored".

Once locations are clear, signs and labels should be used to identify items and their locations. A standardized system of labels and signs should be used, as it is easier for the employees to understand. Signs and labels add to the effectiveness of sorting and setting things in order (Quality Training Portal, 2009).

The use of designated locations requires constant attention and discipline from everyone in the workplace. Once it is set in order it has to be kept in order, which requires the concentration and participation of every employee.

#### 4.4 Shine

The third phase concentrates on keeping the work place clean and thus "shining". According to (Borris, 2005, 174) as the whole 5S process progresses, overall time used on physical cleaning is reduced. This is because an active approach to overall cleanliness is initiated.

Shine can be divided into three different aspects: getting the workplace clean, maintaining its appearance, and using preventive means to keep it clean. Although all three aspects are simple to execute there are some details to adhere to.

When cleaning the workplace some time should be taken to plan it. Before starting it should be decided what needs to be cleaned, what will be used to clean it, when will it be cleaned, and who will be responsible for the cleaning. To maintain the appearance of the workplace there are several steps and practices that can be used, such as: painting, lighting, dust collection, managing the clutter, minimizing spills, and performing everyday maintenance. All of these steps add to the good appearance of the workplace.

Maintaining workplace cleanliness is the third aspect, and the most important one for if it is not followed the whole cleaning process has to be started anew from the beginning. Once the whole workplace has been cleaned, it is important to keep it clean in the future also. One option is to use continuous housekeeping for the work area, tools and equipment, but it is not an effective way, as it just leads to the whole cycle being done over and over. The better option is to prevent the workplace from getting dirty in the first place. This can be achieved by using root cause analysis, mistake-proofing, and preventive measures, which lead to an orderly and clean workplace.

By keeping tools and equipment in their places we gain better effectiveness and less unscheduled downtime. Often, productivity and safety also improve due to a clean work environment (Quality Training Portal, 2009).

#### 4.5 Standardize

"If you think of standardization as the best that you know today, but which is to be improved tomorrow; you get somewhere." – Henry Ford.

The fourth phase in the lean cycle is standardization which involves creating a consistent approach for carrying on tasks and procedures at the workplace (Lean Manufacturing Solutions Inc., 2008). This phase is especially important, because without standardized operations the first three phases cannot be properly implemented.



Firstly, all employees must be made aware of their roles and responsibilities. These roles and responsibilities must be clearly informed and consistently applied. The roles when implementing 5S techniques are rather straightforward. The whole workforce needs to commit to the changes, and abide by them. Managers especially need to fully endorse the 5S techniques, as they are expected to lead by example. Managers must also provide time for the employees to implement and develop 5S changes, provide guidance with those changes, and support the changes (Lean Manufacturing Solutions Inc., 2008.)

Training is needed to explain 5S techniques and how to apply them at the workplace. As the 5S's are adopted in a company work-area by work-area, each area will develop unique approaches and methods, and employees working in the areas must receive training for their work-area-specific methods (Lean Manufacturing Solutions Inc., 2008). And, as with any new skill, practice and repetition leads towards perfection.

Standardization is about creating the best practices, and then having everyone apply the exact practice (Lean Manufacturing Solutions Inc., 2008). For 5S to work, everyone at the workplace has to work according to the "best practices" standards. Often it takes some documentation to define the best methods, which can take some time, but in the long run it is more effective for everyone. Different visual-aid techniques can be used, such as color-coding, checklists, and labeling, which help to strengthen the use of standard techniques, and methods.

#### 4.6 Sustain

As can be seen in Figure 4 sustain is the one phase that gathers all the other phases together. The fifth phase is the most important one in the long run, and it is also the most difficult one to implement.

Communication is the key to keep the 5S process going. "Sustaining requires keeping everyone involved, continually reinforcing what and why the 5S's are important." (Lean Manufacturing Solutions Inc., 2008). The roles and responsibilities given must

be maintained. A good leadership is required to sustain the 5S, as well as commitment to the process, adequate time and resources, and strong communication amongst employees.

The biggest risk is sliding into old ways of doing things, thus nullifying the whole implementation of 5S. There are several ways of preventing backslide according to Lean Manufacturing Solutions Inc (2008).

- Performing regular audits to check on 5S activities
- Building a team work approach to the whole 5S, thus having everyone working for a common goal (this should be introduced in the first stages)
- Encouraging employees to develop ideas to sustain and develop the 5S effort
- Immediate reaction to problems that arise.

Sustaining the 5S is a continuous process, which involves the whole workplace, and all its employees. It takes a lot of work to maintain, but increased effectiveness, job satisfaction, productivity, and safety make it worth achieving.

## 8 Conclusion

After the last store was certified to use the new working methods almost two years have passed since the project group first sat down to consider this case. A major change was successfully finished from the project point of view. Even though the project was finished the real work was only beginning. The company loaded massive expectations for gathering savings from more efficient working routines and more skilled employees.

The findings from the project were absolutely crucial for Tradeka Oy to be able to retain a competitive level of efficiency relating to workforce. The efficiency relating to KPI's such as turnover/working hours and turnover/sales increase annually as the competitors are opening new stores and markets become divided. This decreases the profitability margin and fixed costs, such as employee costs. Basically, this means that the same duties must be completed with less working hours. This can only be

reached through more effective working routines. That was the key reason for making this project.

The findings in this project can be applied in the majority of stores as well as with the majority of employees of Tradeka Oy. The basic models are described in the manual which was handed over to all the stores. That does not mean that the stores should not use their own imagination or common sense to apply the routines in their store. The savings calculated from the improvement of efficiency were never disclosed to store employees. That was because the word efficiency is usually understood wrong by employees and may turn against the idea.

Now, in the autumn of 2009, a year and a half after the project was finished we can say that we succeeded. There are still some issues within the stores but looking at the efficiency KPI's we have reached almost an 30% increase in efficiency. The stores are still holding their daily briefing sessions. Each person knows how their store is performing and most importantly each person knows how their daily performance affects the entire store performance. Before the project there were employees that did not have a clue how much the shrinkage percentage of the meat department, for example, affected the profitability of the store. The euro amount for a single day was not much, but when multiplied by 300 it came to be a huge sum of money that was literally thrown into the organic waste bin. We always tried to clarify these in a way that was easy to understand. In this case we used the example that in a medium size store the shrinkage equaled one new BMW thrown into a waste compactor. When you multiply this by 25 stores it makes quite a few BMWs in a waste bin.

One of the most important aspects of the project was learning to understand different kinds of people. It was almost a shock to observe how people reacted to the changes on their working routines. One knows how one works and deals with the changes but meeting for the first time with people who have a strong resistance to change one had better have good arguments and reasoning for support. People can be forced to work in new ways for a short time, but the changes are not adopted and people tend to revert to old methods and familiar routines once no one is present to enforce the changes. The key here was to give good reasoning and make them try the new methods while giving the possibility to return to the old ways. None of them

ever returned. Sometimes they figured out the more efficient way themselves and sometimes the people were made to feel that they had come up with the new method themselves. Anyhow, people ended up adopting the new procedures. Sometimes it took more time and effort though. Not only the employees had these kinds of problems. Management also resisted. They went through the same kind of resistance process but we were not so tolerant with them. We needed management support and if the management did not give support we changed the management. That is what happened in a couple of places. Knowledge about how people behave and take different kind of situations was certainly one of the most valuable lessons in developing leadership skills.

Even though the things we taught employees were quite simple the impact to the company profitability was huge. Some of the employees were not aware of any of the reports that were available to see how the employees department was performing. Not much can be expected of employees if they do not know what is required of them or what manner of tools are available to make their work better. To even speak about targets in such a situation is unrealistic. The variance between the skills of department heads was huge. Each of them had different kind of routines to deal with the daily procedures. One thing united them all: each one of them had at least one useful method or procedure which could be copied and used in other stores.

All in all, the project was a great experience and it has already been proven that knowledge of lean management is highly valued in work life. If one ever has a chance to add a lean project to their CV, they should grab that chance.

## 9 References

- Cooperation Tradeka Corporation. (2008). *History: Tradeka Corporation*. Retrieved June 12, 2009, from Cooperation Tradeka Corporation Web site: <http://www.tradeka-yhtyma.fi/frames/etusivu.html>
- Drew, J., McCallum, B., & Roggenhofer, S. (2004). The Essence of Lean. In J. Drew, B. McCallum, & S. Roggenhofer, *Journey to Lean : Making Operational Change Stick* (p. 15). Gordonsville, VA, USA: Palgrave Macmillan.
- Gemba Research LLC.(2009). *Value stream - Kaizen & Lean Manufacturing Glossary*. Retrieved November 10, 2009, from Gemba Research LLC website: <http://www.gemba.com/resources.cfm?id=320>
- Lean Enterprise Institute. (2009). *Principles of Lean: Lean Enterprise Institute*. Haettu 23. September 2009 osoitteesta Lean Enterprise Institute Website: <http://www.lean.org/whatslean/principles.cfm>
- Lean Search Marketing. (2009). *Lean Search Marketing | How to use 5s to Organize the PPC Keyword Factory*. Retrieved November 3, 2009, from <http://www.semoe.com/2008/01/27/lean-search-marketing-how-to-use-5s-to-organize-the-ppc-keyword-factory/>
- Liker, J. K., & Meier, D. (2005). Chapter 3. Starting the Journey of Waste Reduction. In J. K. Liker, & D. Meier, *Toyota Way Fieldbook : A Practical Guide for Implementing Toyota's 4Ps* (pp. 35 - 36). Blacklick, Ohio, USA: McGraw-Hill Companies.
- Liukko, T., & Kajaste, V. (1994). Kuva 3. Lean-toiminnan keskeiset teemat. In T. Liukko, & V. Kajaste, *Lean-toiminta – Suomalaisten yritysten kokemuksia* (pp. 13). Helsinki, Metalliteollisuuden Kustannus Oy.
- Resource Engineering, Inc. (2009). *5S's Sort: Clearing the Work Area: QualityTrainingPortal*. Haettu 6. October 2009 osoitteesta QualityTrainingPortal website: <http://www.qualitytrainingportal.com/resources/5S/sort.htm>
- Strategos. (2009). *Lean Manufacturing History*. Retrieved September 10, 2009, from Strategos Inc Web site: [http://www.strategosinc.com/just\\_in\\_time.htm](http://www.strategosinc.com/just_in_time.htm)
- Suomen Lähikauppa Oy. (2009). *Vuosikertomus 2008: Suomen Lähikauppa Oy*. Retrieved May 12, 2009, from Suomen Lähikauppa Oy Web site: [http://www.lahikauppa.fi/static/vuosikertomus/2008\\_fi/](http://www.lahikauppa.fi/static/vuosikertomus/2008_fi/)
- VALO-Projektin kuvamateriaali. 2007. Digitaalikuivat sekä taulukot. Helsinki: Tradeka Oy
- Value. (2009). In *Merriam-Webster Online Dictionary*. Retrieved November 2, 2009, from <http://www.merriam-webster.com/dictionary/value>
- Womack, J. P., & Jones, D. T. (2003). Lean Thinking versus Muda. In J. P. Womack, & D. T. Jones, *Lean Thinking*. London: Simon & Schuster.