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WASTE REDUCTION AND COST CUTTING STRATEGY FOR TEXTILE PRODUCTS THROUGH LEAN MANUFACTURING CONCEPT

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Hartmann-Rico a.s. is continuously focused on lowering production costs. The Hartmann Production System /HPS/ is based on generally applied methods of industrial engineering, such as the 5S, Poka Yoke, and SMED , which further develop value-added theories in the production process.

This article includes proposals for approaches to cost cutting based on the lean manufacturing concept.

Keywords: world-class production system, lean manufacturing, value stream mapping, lead time, added value, wasting, productivity increase, customer tact time, production management and logistics.

Introduction.

The task of the management at every company is continuous pursue for increasing the company's value. The managers keep asking whether the resources available to the company are targeted in the right direction and how effectively they are used. Today, in times of the world economic crisis, when the companies search for further reserves for decreasing production costs and losses in the company's business processes, such subjects are highly topical. The managers can no longer do with routine approaches towards problems solving; they are rather forced to look for new and unconventional approaches in the field of company management and in particular in the innovative and investment activities of the company.

In the 20th century, a new and unique approach towards organisation of production was introduced by Toyota. The Toyota Production System (TPS) was created to oppose the system of mass production used by e.g. Ford or General Motors, which relied on production of mass orders and had significant capital resources. At the beginning, Toyota

produced cars in small series, in various model lines and thus on different production lines. The company had limited capital resources and was forced to monitor its cash flow speed and ROI.

The primary objectives of high quality, low production costs and shorter propagation times are the core principles of production management at Toyota.

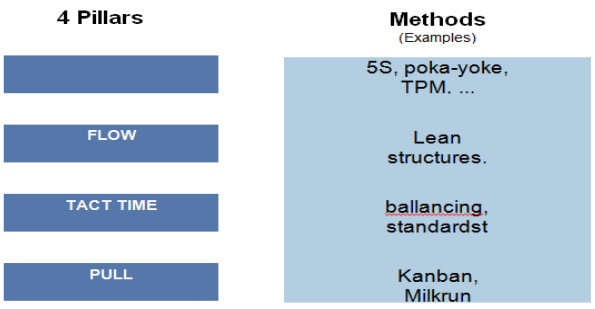
The founder and author of TPS, Taiichi Ohno, defines the principle of "lean production" as follows:

"The only thing we do is to monitor the time since the moment of receipt of an order from the customer to the point of receiving the money. This time is reduced when we remove losses that do not add any value" [4].

This seemingly simple definition hides several key principles that are fundamental for successful introduction of the slim production concept. These involve the terms "customer", "wasting", and "propagation time." The pre-requisite for successful introduction of the slim production concept is that the content and importance of the above terms become everyday habit and a part of the corporate culture.

The strategy of implementation of slim production principles is based on four interconnected pillars included in picture 1, [7], [8]:

1. Zero defect principle.
2. Flow.
3. Tact time.
4. Pull.



Picture 1. Four pillars of Lean Production

In the context of company's strategical management the concept of lean manufacturing is directly related to all areas of corporate activities [1]. It is based on the company's mission and visions and it contributes to the enrichment of the corporate culture with processes of continuous improvement. The examples of interconnection of lean production with methods of strategic management of the company (e.g. via Balanced Score Card) are known [2], [5], [6].

Application of lean production principles is not only limited to industrial use. Due to pursuit of continuous decrease of processing costs and strengthening the company's position on the market this concept is more widely applied also in the area of services, supplier-consumer relationships and state administration.

Analysis of Current State of Production Processes at Hartmann-Rico, a. s., Veverská Bítýška.

To date, Hartmann-Rico has successfully implemented the basic methods of industrial engineering, such as the 5S, TPM, SMED, Poka-Yoke, and Kaizen methods. These methods, along with the Balanced Score Card management system, create the framework of the production system of the Hartmann-Rico, the HPS.

The decision on application of the lean production concept at Hartmann-Rico, a.s. thus follows the above mentioned activities and is only a logical outcome of the long-term waste cutting strategy in the company management, decrease in production costs and increase in production flexibility [1].

Hartmann-Rico started to implement the lean production concept in 2009, under the guidance of the renowned German consultation company Staufen AG. The project itself is divided into the following areas:

1. Analysis of the current state of production of nonwoven medical drapes.
2. Application of lean production principles on the conditions of Hartmann-Rico,a.s., Veverská Bítýška.
3. Totally productive maintenance /TMP/ and SMED.
4. Logistics of internal processes and production management.

The following paragraphs describe the methodology and document results of the analysis of the current state of the medical drapes' production in Hartmann – Rico, a.s., Veverská Bítýška. This analysis serves as the

primary basis for proposal of measures directed to areas of production processes, internal logistics and totally productive maintenance.

– Hartmann- Rico a.s., Veverská Bítýška plant, as one out of four production plants in the Czech Republic, produces disposable medical drapes. This plant is 100% owned by the Paul Hartmann AG Group.

– The current competitive pressure effects all four production plants. These plants must repeatedly demonstrate their efficiency and competitive ability. Significant decrease in production costs is expected for the years to follow. The closeness of the European markets together with support of processes of excellence for adding value in production and logistics should provide for competitive ability and strengthen the future position of the plants.

– The range of products of the Hartmann-Rico, Veverská Bítýška plant comprises more than 3,000 different products divided into 8 product groups.

– The system of production management and production of sets for single operational coverage can be divided into 2 groups.

– Standard Sets, i.e. sets that are not primarily pushed by the particular demand of the company.

– CPT / Customer Procedure Tray / sets produced specially according to the customer's needs.

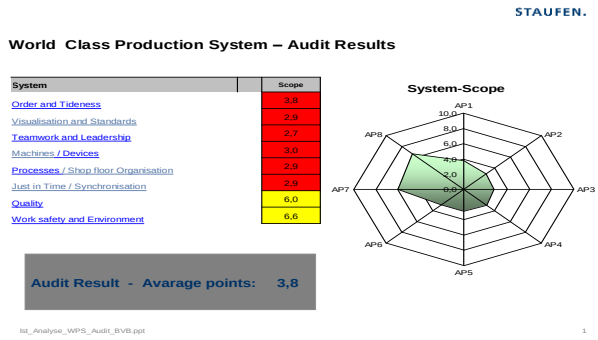
In the context of competition of Asian producers the very CPT products constitute incomparable advantage in the form of low propagation time.

However, the approach to management and organisation of production within the Standard and CPT group is significantly different.

Proposal for the Algorithm of the Cost Cutting Strategy via Reduction of Wasting

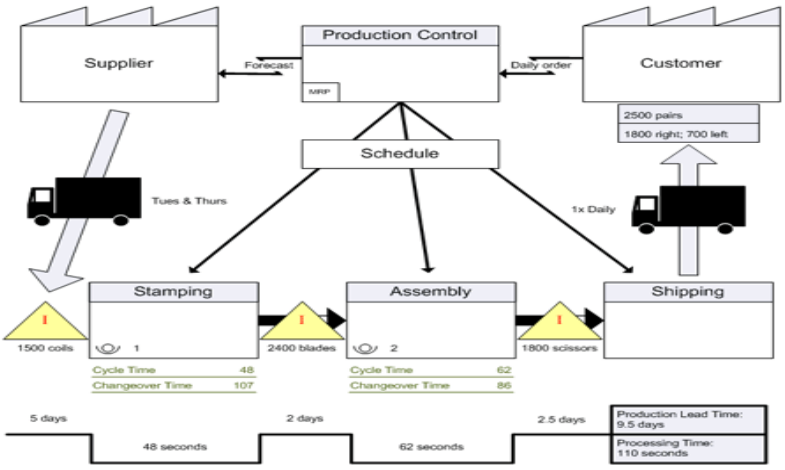
In order to reach the expected outcome we proposed the following procedure algorithm:

1. To carry out analysis of the potential and to point out the opportunity to improve the production process of medical drapes, including production and logistics management, by means of Word Class Production System Audit, as seen in picture 2.



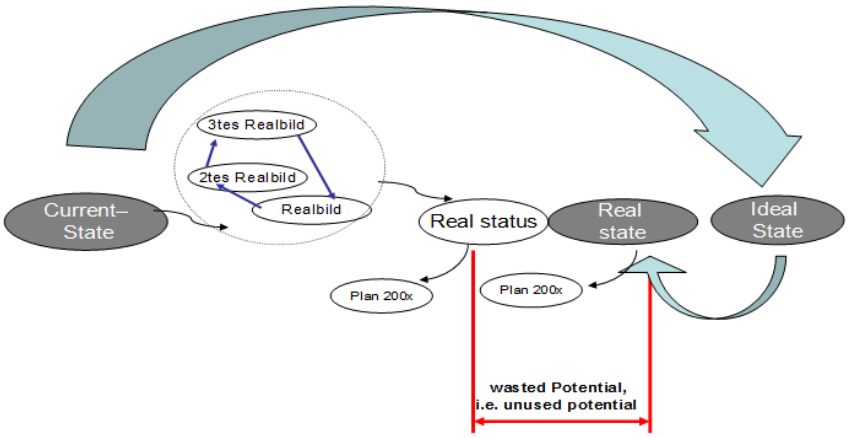
Picture 2. Audited areas within the WPS audit

2. Using the Value Stream Mapping [4] method to carry out evaluation of the chain of adding value to the product and to propose its optimisation, considering supplier-customer conditions being unchanged.



Picture 3. Measurement and design of the process by means of the Value Stream Mapping Method – simplified diagram.

3. To elaborate the "ideal production plant" management model, which will respect the principles of lean production of "world class" type [7].



Picture 4. Example of prevention of unused implementation reserve

4. To simplify the system of production management and logistics of raw materials and intermediate products.

Expectations consist in testing and the subsequent application of hypotheses in the process of searching for optimum production of single operational coverage's products.

As benchmarks it is possible to use already published benefits for company economy, such as reach of stock, lead time, productivity increase, reduction of quality defects, number of fire fighting cases.

In the particular case of implementation of the lean concept at the Hartmann Rico, a.s., Veverská Bítýška plant the following economic benefits are expected:

– Lead time reduction by 50%;

– Increase in work productivity in the area of set assembly by 30%, including the subsequent savings of labor costs in the amount of 30 million CZK p.a.;

– Optimisation of TPM and SMED for key production technologies with the objective of change - over time by 100%;

– Simplifications in process management, especially shop floor management, and update of already existing Kanban system;

– Synchronisation of sub-processes and decrease in administration burden (including the need of "fire fighting");

– Improvement of working systems, including ergonomic workplace.

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