Randel Ltd.

A PM on Lean Production Randel Ltd.

RANDEL LTD.
INDUSTRY STREET 8
38267 WOMANCHESTER
ENGLAND

Written by: Tobias Reith, BSc
Course: Lean Production (2016)
Linköping University, Sweden

A PM ON LEAN PRODUCTION

1. Situation and background of the company

Randel Ltd. was established in the early 1970s and is a medium-sized company with a 170 employees. The company develops, manufactures, and supplies metal sheets to various manufacturing companies. They offer both standard and make-to-order products. The manufacturing process is basically unchanged since the company startup. The production has a functional layout and each order needs to travel to several departments. The shop floor is crowded with dirty machines and large piles of piles of WIP and raw material, which contributes to high rate of work accidents. The sick leave is high and the production often lacks workers to handle make-to-order products. A few years ago, Randel faced increasing demand but its long lead time, late delivery record and inconsistency in product quality creates customer dissatisfaction and opens the door to competitors. Randel experiences currently financial problems and need support from their shareholders. The shareholders promised to support the company, but only under the condition that the production efficiency and on time delivery improve.

2. Background on Lean Production

In the first chapter the background of Lean Production is going to be evaluated mainly based on the paper "Learning to evolve – A review of contemporary Lean thinking" by Hines, Holweg and Rich from 2004. The concept of Lean Production has its origin in Japan around 1950. At this time there was intense competition among Japanese companies due to scarcity of resources and they had to come up with resource efficient concepts in order to survive. Toyota was the leading company at that time which invented a few of the core Lean principles at that time. With concepts like Just-in-time production, Kanban ("pull"-system) and high levels of employees who are able to do direct problem-solving, Toyota was able to reduce the cost and therefore keep up the margin. (Hines et al., 2004) The main focus was the reduction of all kinds of "muda" (waste) like overproduction, inventory, waiting, motion, transportation, rework or over processing, but still keeping up the respect for employees. (Okpala, 2014)

By applying the Lean tools a lot of companies could benefit already, but the concept was mainly focused on automotive manufacturing and demand variability displayed a big problem. Womback and Jones (1996) were the ones who shifted the shop-floor focus to a wider perspective. They invented the so called „Lean principles" which were more or less a step by step guide for every company to integrate Lean based on individual value streams. At first the customer value has to be identified, followed by analyzing the value streams of every product/service. The creation of a flow production based on a „pull" mechanism

displays the next step. In the end this should be continuously improved by reducing all kinds of waste. (Hines et al., 2004)

Hines and Rich even extended this concept by linking the Lean principles to the supply chain. Therefore the "pull" system should be applied with up- and downstream partners. (Hines et al., 2004) Martin Christopher, a specialist in supply chains, emphasized at that time the importance of having a good relationship with your suppliers and customers. The future competition will not be company against company, but rather a competition between supply chains. (Christopher, 2011)

Womback and Jones clarified with the concept of lean thinking the relationship between value and cost. Adding product/ service features and/or removing wasteful activities should constantly enhance value. Therefore "muda" is linked to customer requirements. (Hines et al., 2004)

2. Core principles of Lean Production

The most famous Lean principles are from Womback and Jones (5 principles, 1996) already presented in the first chapter and from Liker and Meier "The Toyota Way" (14 principles, 2001). Due to the fact that the 14 principles by Liker and Meier were written later and also focus on "respect for people", these principles are going to be explained in more detail in this chapter and are later applied on the current problems in Randel Ltd. The 14 principles are based on the 4Ps, which represent Philosophy, Process, People & Partners, and Problem Solving. "The Toyota Way Fieldbook" serves as the main reference book for this chapter. (Liker & Meier, 2005)

1. Management decisions based on a long-term philosophy. It is important to have a long-term vision for the company and often short-term financial goals have to be sacrificed in order to benefit in the long run. The number one priority of the company should not be generating profit, but rather providing value for the customers, economy and the society.

2. Continuous process flow. Creating a flow in the production will enhance the visibility of problems/waste like inventory, bottlenecks, long setup time, poor quality etc.

3. "Pull" systems to avoid overproduction. Inventory is costly, inefficient and hard to forecast. A kanban (pull) system works like a supermarket, every product will only be produced when the customer (or the next workstation) is buying/taking a part. Therefore the stocks can be kept at a minimum level.

4. Level out the workload. The demand is to a certain degree always unstable and unpredictable. Peaks can result in overburden for the employees (muri), different kinds of waste like inventory (muda) or fluctuation in the production levels. Leveling out the workload reduces these problems significantly (Heijunka). One way Toyota is coping with this problem are workers from contracting companies.

5. Build a culture of stopping to fix problems. The theory behind this concept is that workmen should not wait until a defect is detected by the quality control department or

even at the customer. It is necessary that every employee directly signals a problem if he/she found a defect in order to fix it immediately (also called jidoka). Therefore the products are produced *right first time*.

6. Standardized tasks and processes. Predictability, stability and repeatability are the basis for processes in order to implement a pull or flow (production). By standardizing these processes the current level and best practice can be evaluated and from there continuously improved.

7. Use visual control. Even high-tech companies like Toyota sill rely on paper, which is used for the Kanban system or Heijunka boxes. Using different colors, visual aids or diagrams can help to identify potential problems in a short period of time.

8. Use only reliable, thoroughly tested technology. It is necessary to use state-of-the-art technology in order to keep efficient processes. Nevertheless an implementation should only happen, when the technology is tested, needed and support not only the process, but also the people. Sacrificing stability, predictability or reliability is not worth the try.

9. Grow your own leaders. According to Toyota it takes years to develop an external manager until he/she works autonomously. Therefore Toyota tries to avoid hiring external managers. The company set great value upon training their own leaders who fully understand the work, live the "Toyota Way" philosophy and pass on this knowledge.

10. Develop exceptional people and teams. The Toyota Production System is based on the people who use the tools and system every day. Therefore the Toyota Way emphasizes to constantly train your employees living the company's philosophy and culture. Furthermore the employees should be involved in decisions and get the empowerment to improve, plan and control daily operations.

11. Respect your extended network of partners and suppliers. Like stated earlier, already Christopher (2011) explains the importance of having a good relationship with your supply chain, up- and downstream. The Toyota Way also displays the supplier as the extension of the company, which shall be challenged to improve and supported.

12. Go and see for yourself, or genchi genbutsu means that real improvements can only be realized when the current situation is observed in detail and fully understood. Toyota even challenges high-level managers to not solely focus on reports, but investigate the problem personally on the shop-floor level.

13. Make decisions slowly by consensus; implement decisions rapidly. This is called *Nemawashi* and displays a time-consuming procedure. So at first the „go-and-see" principle is applied to investigate the problem in detail and not only the surface (ask the "Five Whys"). All the possible alternatives are taken into account in order to find a consent solution in the end, but the implementation of the solution can happen fast.

14. Become a learning organization. The basis for companies to stay competitive after the achievement of stable processes is continuous improvement (kaizen) and constant reflection (hansei). The most famous tools in this regard are the "PDCA-Cycle" or the "Five-Why-

Analysis". Constant training for the employees is vital to keep an effective learning organization. (Liker & Meier, 2005)

3. Benefits for Randel Ltd. from implementing Lean

Randel Ltd. has various problems in the company, especially in the production. In the next chapter a closer look is taken on the advantages Randel Ltd. can gain by implementing Lean Production. These advantages can only be achieved when the leaders and employees are trained and understand the company's philosophy. This is necessary so that the Lean tools are not only applied in the first weeks, but all employees make continuous improvement. (Liker & Meier, 2005)

Advantage 1: Shorter lead time and effective, lean processes

Lean Production offers tools, which enable an enormous improvement potential regarding the processes in an organization. Randel Ltd. faces currently big problems regarding the lead time, old layouts and orders which need to pass too many departments.

Regarding the 5 or 14 Lean principles, the first step is defining the value your company offers and establishing a continuous work flow (with the help of value stream mapping). (Womack & Jones, 1996) Therefore all different kinds of waste get visible ("7 types of waste"), can be eliminated and the focus lies solely on the value-adding processes. (Okpala, 2014) Especially old layouts like in Randel Ltd. often need a radiacal improvement („kaikuka") rather then kaizen (continuous) at first. Applying SMED can reduce the setup time and therefore the lead time even more. After reaching a certain level, these processes can be standardized and should be continuously improved. (Liker & Meier, 2005)

Advantage 2: Low inventory, less accidents and fewer overburdened, sick employees

Currently the shop floor is covered by raw material and dirty machines, which lead to accidents, over-average numbers of sick leaves and the lack of workforce. Lean Production offers solutions and tools for these problems as well.

After the implementation of a continuous flow, the next step is the integration of a "pull"-system. Therefore only the products are produced, which are ordered/ pulled by the customer and the inventory (raw material, WIP) can be minimized. If the demand per month is approximately known, the production can be optimized regarding the tact time. Therefore the reliability and predictability increases significantly. Additionally the workload can be leveled out, overburden by employees is reduced and peaks should be handled f.ex. by a contracting company. Not only for the over-production Lean Production offers a solution, but also for the dirty machines and workplaces. This tool is called "5S" and the core principles are sorting the used items, organizing a place for everything and keeping the workplace clean. "Sustain" and "Standardize" make sure that the first three S's are

maintained, understood and applied. (Liker & Meier, 2005) In the end the accidents and therefore sick leaves can be drastically reduced and make-to-order products can be handled immediatly.

Advantage 3: High product quality with zero defects

The inconsistency in product quality has also a significant impact on the customer satisfaction for Randel Ltd. If Lean principles like "Mistake-Proofing" (fix problems directly) applied correctly, the number of defects can be reduced to zero ("Right first time"). Visual controls (like diagrams) or "Poka-Yoke" additionally ensures the quality. (Liker & Meier, 2005) Total Productive Maintenance (TPM) aims to prevent any defects or machine breakdowns before they even happen. (Okpala, 2014)

Advantage 4: Foundation to stay competitive in the long term

In the end Lean Production even helps to create a long-term philosophy for the company and implement a culture around Lean principles. Therefore the work, but also the improvement does not stop after the implementation of Lean Production. One cornerstone is Kaizen (continuous improvement), which states that the current standard should constantly renewed and set on a higher level. (Liker & Meier, 2005) These 4 advantages not only will get the company more orders due to higher customer value (features) delivered, but also reduce the cost (waste) and therefore increase the profit (see Figure 1). (Hines et al., 2004)

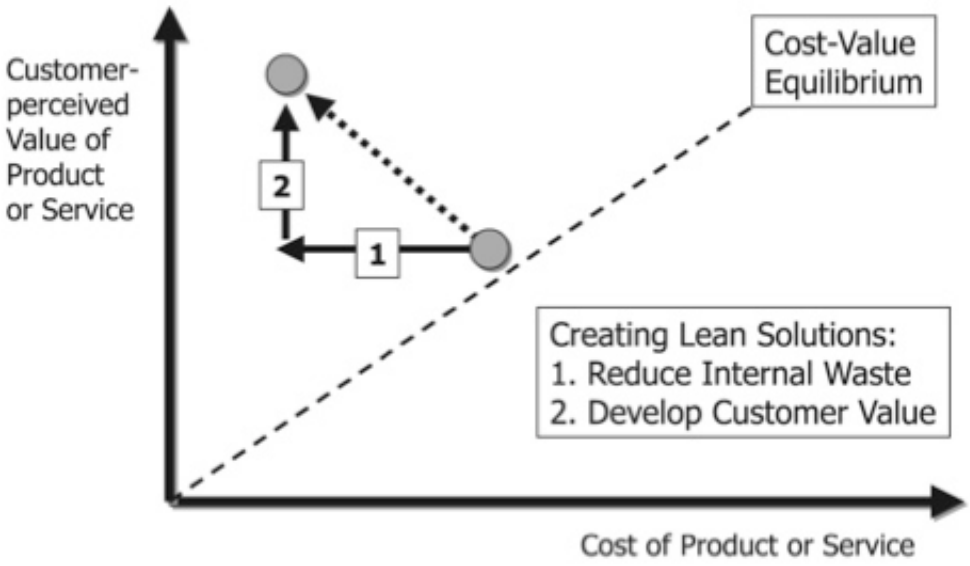

FIGURE 1: RELATION BETWEEN COST, VALUE AND WASTE (HINES ET AL., 2004)

Literature

Christopher, M., 2011. *Logistics & Supply Chain Management*. Halow: Financial Times Prentice Hall.

Hines, P., Holweg, M. & Rich, N., 2004. Learning to evolve - A review of contemporary lean thinking. *International Journal of Operations & Production Management*.

Liker, J. & Meier, D., 2005. *The Toyota Way Fieldbook*. 1st ed. New York: McGraw-Hill Education.

Okpala, C., 2014. Tackling Muda – The inherent wastes in manufacturing processes. *International Journal of Advanced Engineering Technology*, Vol. V.

Womack, J. & Jones, D., 1996. Beyond Toyota: how to root out waste and pursue perfection. *Harvard Business Review*, Vol. 74(No. 5).