

AN EVALUATION OF THE NPD PROCESS FROM A LEAN PERSPECTIVE

A master thesis at Oriflame Cosmetics

Dan Möller
Jonathan Viklander

Department of Industrial Management and Logistics,
Lund University, Lund Institute of Technology
SE-221 00 Lund, SWEDEN

ABSTRACT

This article is based on a study (Möller & Viklander, 2010) conducted at Oriflame Cosmetics in Stockholm 2010. The purpose of this study was to propose improvements to Oriflame's new product development process from a lean perspective.

In this study a model was developed to measure a company's lean product development maturity level. The model is called Lean product development maturity model, LPDMM. This model was used by the authors when interviewing process managers in the new product development process to do a gap analysis, defining what level it is today and which level Oriflame should aim for in the future. Also a comprehensive questionnaire was created and sent out to the people working in the process to get a better understanding of where potential problems could be found.

The reasons for the gaps recognized by the model were analyzed and showed 11 areas of improvements. To enhance the work in these areas and to fill the gaps 10 improvement suggestions were found which are presented for Oriflame to consider.

1. BACKGROUND

New product development is a complex process for bringing new products to the market. While manufacturing is a very repetitive process, the new product development has to be more flexible as the same product is never developed again. Therefore the theory behind lean manufacturing is not applicable in new product development. This meant that instead of lean manufacturing, a more dynamic development method extracted from Toyota development system had to be used as a theoretical framework for this thesis. This method is called lean product development.

2. OBJECTIVE

The objectives of the study were to create a value for Oriflame in terms of suggestions for further improvements of its new product development process along with creating a picture on how the process was performing today compared to the lean way.

3. METHODOLOGY

The approach used in the thesis, see Figure 1, is a result of careful consideration by the authors. The practical approach follows an approach called LAMDA (Look-Ask-Model-Discuss-Act) which ensures that a sufficient ground is captured before the analysis begins (Holmdahl, 2010, p. 121). The Act part is left out as it was not in scope of the thesis.

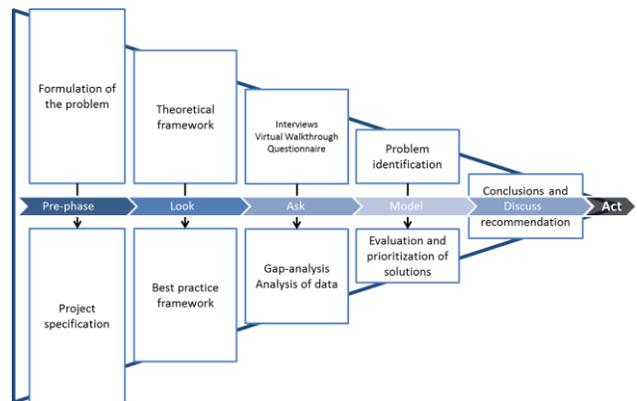


Figure 1 – The practical approach used in the thesis

Look: A literature study was used to build a theoretical framework which then was used to produce a best practice framework together with the LPDMM and a questionnaire. Also company specific research was done.

Ask: By doing interviews with key persons at Oriflame a deeper understanding was received. The model was used

to do a gap-analysis of the new product development process and the questionnaire was sent out to people working in the process.

Model: The data from the interviews and the questionnaire was used to identify problem areas from a lean perspective. These problems were used when the authors developed suggestions on how to improve the process. Each improvement suggestion was evaluated and prioritized for when to be improved.

Discuss: In this phase conclusions that were drawn along the study are presented along with recommendation for Oriflame to consider going further with.

4. THEORETICAL FRAMEWORK

While product development is clearly a unique environment, the work performed across projects is similar and can benefit from some of the same optimization tools and methods applied to manufacturing. It is possible to manage, standardize and continuously improve the product development process as long as there is a solid understanding of, and allowances are made for, those characteristics of the product development environment that are indeed unique (Morgan, 2002). After a huge in-depth study of Toyota's approach to product development, 13 principles were considered to be the foundation of lean product development. These principles make a frame-work of people, process and tools-technology that can be applied to product development (Liker & Morgan, 2006). The principles are listed below:

People

1. Establish custom-defined value
2. Front-load the product development process
3. Create a leveled product development process flow
4. Utilize rigorous standardization to reduce variation and to create flexibility and predictable outcomes

Process

5. Develop a chief engineer system to integrate development from start to finish
6. Organize to balance functional expertise and cross-functional integration
7. Develop towering technical competence in all engineers

8. Fully integrate suppliers into the product development system
9. Build in Learning and Continuous Improvement
10. Build a culture to support excellence and relentless improvement

Tools and technology

11. Adapt technology to fit your people and processes
12. Align your organization through simple, visual communication
13. Use powerful tools for standardization and organizational learning

Seven waste categories are identified within lean product development: **Overproduction, Transportation, Waiting, Processing, Inventory, Unnecessary movement** and **Defective product** (Millard, 2001).

Lean product development consists of a set of central tools and they all have their foundation in the LAMD learning cycle that captures knowledge. The knowledge is then maintained, exposed and developed through other tools like the A3 communication reports, trade-off curves and checklist.

The new product development is commonly a core process in a company. It is important to identify and map this process so that it can be improved continuously. The management of a core process is also very important to avoid functional silos and sub-optimization. The management can be divided into three levels; process owner, team leader and resource owner. A quick view on how this management is carried out can be seen in Figure 2 (Ljungberg & Larsson, 2001).

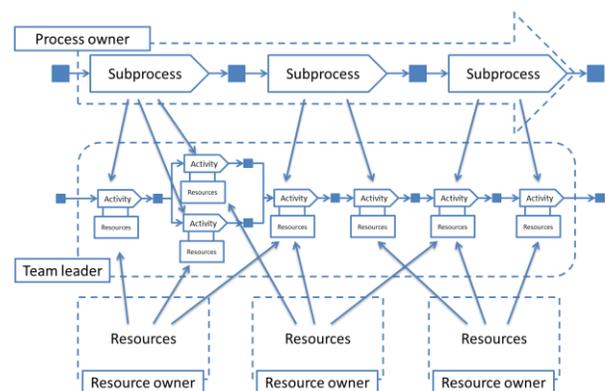


Figure 2 - A model on how to manage the process organization as Ljungberg & Larsson describes it

5. ANALYSIS OF CURRENT PROCESS

The model developed by the authors, LPDMM, was used to perform a gap-analysis of the current process. Each one of the 13 principles that found lean product development is evaluated through a question with one statement for each level from zero to five, where zero indicates not lean at all and five indicates lean. This model can be viewed in full in the master thesis but the first principle with question and levels can be found in Figure 3.

Principle	1. Establish customer-defined value to separate value added					
Question	Does Oriflame focus on creating value for the customer?					
Level	0	1	2	3	4	5
Description	No focus at all.	Methods for defining the value are not formalized and very unorganized.	A process for defining the customer value is used for some customers.	A definition how customer value can be created is used in most projects.	The customer defined value influence all strategic decisions taken in the NPD process.	Customer defined value is the strongest driving force within the whole company.

Figure 3 – Principle 1 in the LPDMM

After asking each process manager the questions from the model and combining their answers a median value was received; both for an “As is”-value and for a “To be”-value. These values can be seen below in Figure 4.

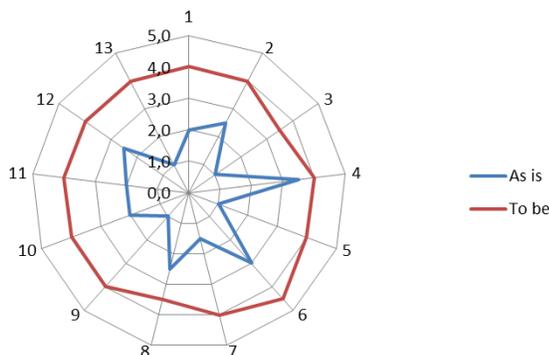


Figure 4 – A spider chart showing the “As is”-level and the “To be”-level of the gap analysis

It is easy to see that principle 5, 9, 13, and 3 has the biggest gap and that principle 4 and 8 has the smallest. The overall level is regarded quite low.

To get a deeper understanding of why the “As is”-level was quite low interviews were held with each process manager and also a questionnaire, based on the 7 wastes in lean product development and also the 13 principles and it

also contained a qualitative part, was sent out to all the people working in the process. The interviews gave good response and 15 problems could be found, and later connected to the principle it affected. Also, from the questionnaire which was divided into three parts, a number of problems could be found.

The problem identification was done to sort out and prioritize problem areas. This was done in different ways for each collection of data. From the analysis of these problems, 11 different problem areas that affected the process were extracted.

6. IMPROVEMENT AREAS AND SUGGESTIONS

The 11 areas of improvement suggested by the authors are:

1. Technology
2. Front-load of the process
3. Responsibilities, ownership and management
4. Extended continuous improvements
5. Better employee development
6. Information pull instead of push
7. Standardization
8. Alignment
9. Communication
10. Organizational learning
11. Reducing variations in work-load

To be able to solve the problems, a number of suggestions of how to improve the process have been identified based on the theoretical base of lean product development. In the thesis, these tools are explained together with an explanation on how Oriflame should use them.

1. LAMDA
2. Clear management and ownership
3. Using A3-reports for communication
4. Visual management
5. Enhanced continuous improvements
6. Usage of knowledge database (e.g. wiki)
7. Standardize processes, competences and tools
8. Enhanced employee development
9. Implement technical solutions
10. Using set-based work

Each of the suggestions affects the outcome of one or many principles in a lean way. The table below shows a suggested indication of how great the affect from the

suggestions is on each principle. A green arrow (up) indicates that the effect is direct and great. A yellow arrow (up right) indicates that it has an indirect or moderate effect. The grey arrow (right) is no apparent effect.

Table 1 – Each suggestion’s effect on the 13 principles.

Suggestion	Principle	1	2	3	4	5	6	7	8	9	10	11	12	13
1. LAMDA		→	→	→	→	→	→	→	→	→	→	→	→	→
2. Management and ownership		↑	↗	↗	↑	↑	↑	↑	→	↗	↗	↗	↗	↗
3. A3-reports		↗	→	→	→	→	→	→	→	→	→	→	→	→
4. Visual management		↑	↑	↑	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗
5. Continuous improvements		→	→	→	→	→	→	→	→	→	→	→	→	→
6. Knowledge database		↗	→	→	→	→	→	→	→	→	→	→	→	→
7. Standardization		→	↑	↑	→	→	→	→	→	→	→	→	→	→
8. Employee development		→	↗	↗	→	→	→	→	→	→	→	→	→	→
9. Technical solutions		→	→	→	→	→	→	→	→	→	→	→	→	→
10. Set-based work		↑	↑	→	→	→	→	→	→	→	→	→	→	→

As seen in the table the improvement suggestions have a positive effect on all the principles besides principle 8, “Fully Integrate Suppliers into the Product Development System”, which is not affected. Principle 8 stands for a small gap at Oriflame so no focus has been put to reduce this gap.

7. CONCLUSIONS AND RECOMMENDATIONS

The chart below shows how each suggestion is valued where the cost and the benefit are approximated by the authors. Three groups were identified; uncertain, important and facilitators.

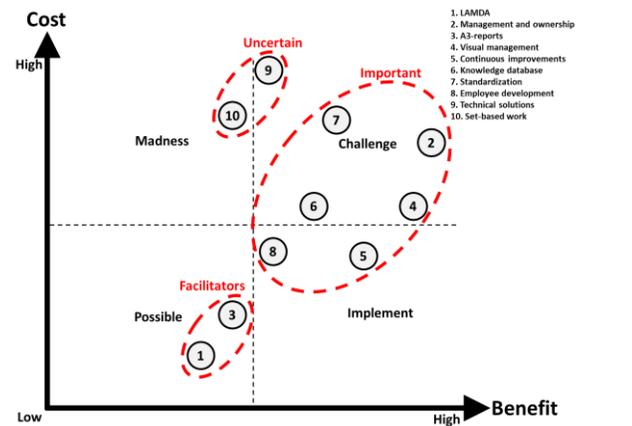


Figure 5 – Cost-benefit chart of each suggestion

The authors recommend Oriflame to begin with the easiest implementations which still gives a great benefit to create a momentum. The employee development and continuous improvement could quite easily be implemented and

would give a great benefit to begin with. Oriflame might continue with Knowledge database, Visual management and Management and ownership and finally Standardization. These suggestions should be implemented in a pace that is manageable but not too slow to maintain the momentum.

Some conclusions were drawn during the study:

- LPD would fit Oriflame in many ways because of the high degree of repetition in the process.
- The entrepreneurial spirit can cause some problems as it counteracts working with processes and standardization.
- Oriflame has to facilitate a pull from the markets instead of pushing out products from marketing.
- Best practices and pre-defined processes, like the stage and gate, should only be used as guide lines. These are always very company specific and it is hard to copy the result of other businesses. It is very dependent on the conditions in the company.

8. REFERENCES

Holmdahl, L. (2010). *Lean Product Development På Svenska* (1.1 ed.). Göteborg: www.larsholmdahl.com.

Liker, J. K., & Morgan, J. M. (2006). *The Toyota Product Development System: Integrating People, Process and Technology*. New York, USA: Productivity Press.

Ljungberg, A., & Larsson, E. (2001). *Processbaserad verksamhetsutveckling*. Lund, Skåne, Sweden: Studentlitteratur.

Millard, R. L. (2001). *Value Stream Analysis and Mapping for Product Development*. Institute of Technology. Massachusetts: Massachusetts Institute of Technology.

Morgan, J. (2002, February 01). *SAE International*. Retrieved September 30, 2010, from SAE in Manufacturing: Applying Lean Principles to Product Development: <http://www.sae.org/manufacturing/lean/column/leanfeb02.htm>

Möller, D., & Viklander, J. (2010). *An evaluation of the NPD process from a lean perspective*. Faculty of Engineering, Department of Industrial Management and Logistics. Lund: Lund University.