

15 May 2014

Continuous improvement and Lean thinking in Statistics Norway (SN)

Authors:

Ms. Anne Sundvoll, Director, Department of data collection and methods, SN. asu@ssb.no

Mr. Peder Næs, Head of Division, Division for Statistical populations, SN. pns@ssb.no

Ms. Grete Olsen, Senior Adviser, Division for Corporate governance, SN. gol@ssb.no

Abstract: Statistics Norway has since 2012 focused on Lean methodology and management as an additional quality assurance system. This paper focuses on how the organisation has worked to succeed with Lean approaches and thinking, continuous improvement, and what challenges we have faced.

The paper describes different stages of the Lean implementation process. The organisation started out by conducting a series of pilot studies. Next, we decided to cover the organisation as a whole. This was, however, challenging, because of complex production structures. The third phase, that has led to success, has been to study processes within each department to simplify the value chain. The Department of data collection and methods was the first unit to work with Lean tools and train the staff in Lean thinking. Involving the staff is central in Lean thinking. The main goals have been to reduce errors in the data collection phase to improve quality and make the process more efficient. An increase of the customer value is crucial in Lean thinking. Hence, tools to reduce waste in the different production steps and to give the customer value for money has been of great importance. The paper discusses success criteria, pitfalls and the way forward

1 Lean thinking

In brief, Lean is a way of creating a culture and management for continuous improvement and delivery of the right value to the customer at the right cost. (The definition of customers for Statistics Norway is all users of our statistics, micro data and analysis, whether the production is financed by the government or by each customer). The improvement work is driven by the staff and the management support improvement and adjust the organisation for change. Different tools are used to study the production process and to involve the staff.

Lean thinking comes from the same sources and experience as TQM, Six Sigma etc.

To introduce the concept continuous improvement, the PDCA cycle is useful (Plan-Do-Check-Act), see figure. The PDCA cycle is an illustration of how you never stop thinking improvement, you plan for change (P) and carry out the plan (D). Then you examine the results (C) and implement verified changes (A) before you start over again with new plans for change).



Another concept from Lean thinking is to reduce waste, see examples in chapter 4.

There have been three main stages in the implementation process in Statistics Norway: Introduction phase, education of facilitators and process reviews, and improvement of work processes within the different departments.

2 Introduction phase

The Division for Human resources started to introduce Lean in Statistics Norway in 2011. It consisted of courses for management. These courses were not obligatory and only a few members of middle management participated. Mainly heads of divisions and group leaders. The courses were not followed up. The participants could attend them and then just forget about Lean after the course. However, the Department of data collection and methods and the Division for Human resources started to use Lean technics.

The Division for Human resources conducted value stream mapping for the processes of recruiting employees, paying salaries and two other routines.

Two of the divisions in the Department of data collection and methods were chosen by the director for the department and examined using Lean tools. They used value stream mapping. The mapping was conducted by employees from the quality team in Statistics Norway. In practice they analysed the data collection activities in monthly retail trade statistics, accommodation statistics and the business register. This resulted in a long list of proposals for changes in the way these types of processes should be performed.

In addition two pilots in the Department of data collection and methods were conducted using external consultants.

We also had a quality team using Lean technics (value stream mapping) in Quality audits. They conducted 10 Quality audits each year in 2011 and 2012.

The main challenges or pitfalls from this first phase were lack of involvement in advance for the middle management. A lot of the findings in Lean resulted in implementation of changes, but some of the recommended changes were never implemented, and others were only implemented after a long period of time.

There was no emphasise on culture or how to go about implementing changes

3 Education of facilitators and process reviews

In spring 2013, Statistics Norway educated 8 facilitators from the internal staff. The training was conducted by external consultants and part of the education was to facilitate a Lean project/review on a production process. 5 production processes were selected for review and they all included more than one department. The reason to include more than one department was that SN wanted to reduce delays and misunderstandings when handing products from one department to another. We had seen signs that indicated some waste here.

The results from these reviews gave improvement in different areas. Staff from different areas learned a lot about their own products and production processes from cooperating across the units, and they learned about Lean thinking. They also developed better processes in different areas. However, we did not see transformation towards a Lean culture with systematic

continuous improvement. Several units in SN were involved in each review, and even though it was clear which middle manager was responsible for which project, there was not enough incentive for middle management to take the responsibility for the implementation of Lean in general and for the improvement in particular, because the follow up of the results and new routines concerned different units.

4 Improvement of work processes in Department of data collection and methods

In May 2013 the Department of data collection and methods started the third phase of Lean implementation in Statistics Norway by organizing a separate Lean project within the department. The project was facilitated by external resources, hence the role of project manager was performed by a specially trained external consultant. In addition, two internal Lean facilitators supported the work, mainly the processes in smaller working groups. The management of the Department of data collection and methods were clearly targeted and involved in the Lean process and were active in the value chain improvement work in smaller groups and in supporting Lean management meetings with the project manager and Lean facilitators.

The project lasted from May 10th 2013 to January 5th 2014. The value chain of observation and chosen action plans was limited to the department's main deliveries and responsibilities. Transverse issues were identified throughout the process, but will be properly addressed in the next wave of Lean implementation in Statistics Norway (2015-2016).

The department defined four main areas/process chains according to their main deliveries:

- Collection of interview data (28 man years)
- Collection of self-administered data (57 man years)
- Collection of administrative data (23 man years)
- Methods (20 man years)

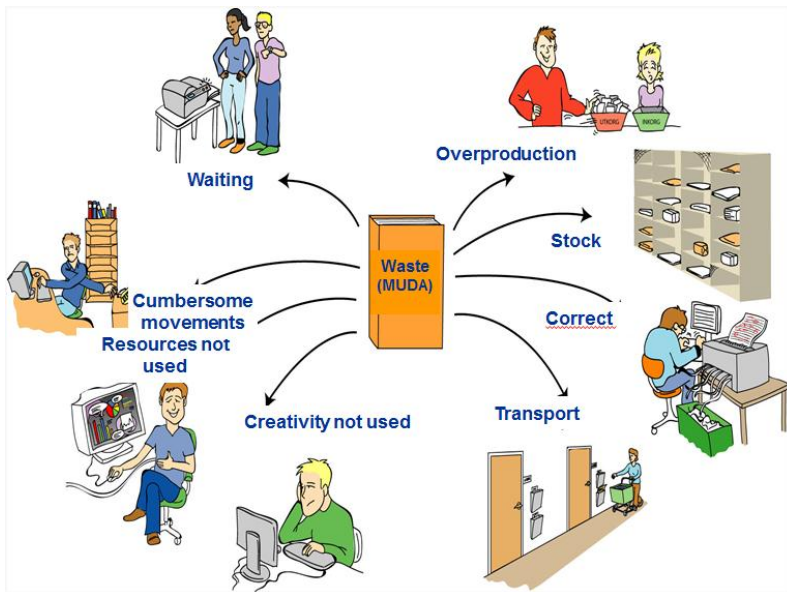
The work was initially organized in four working groups, each covering one of the main processes mentioned above. Later on the Methods group was split in two (data collection methods and statistical methods). Each group worked through 3 phases:

- The diagnose phase (description of the work processes “as is” and identification of sources of waste, duration 6 weeks)
- The design phase (design and preparation of action plans to improve the situation “to be”, duration 8 weeks)
- The implement phase (implementation of action plans and identification of Lean effects, duration 3 months).

The department experienced the first phase as the most exciting and the last phase as the most challenging and resource consuming, for obvious reasons. It is often an easy and motivating job to identify and map potentials of improvement and get the chance to bring up the down sides of work processes with management present and obliged to listen. The group members reported that they learned a lot by discussing their daily work processes in general, and that they challenged each other to look for potential improvements in a creative and non-threatening environment. They also reported that the internal Lean facilitators were a successful part of the Lean process, due to their ability to inspire and motivate the working groups to keep up the good discussion, support creativity, ask questions and make the participants responsible for their acts.

On the other hand, the work of implementing action plans and doing the necessary follow-up with continuous focus on obtaining results, is nothing but hard work.

The main focus of the Lean work in the smaller working groups was to visualise the actual value chains, and come up with situations of “waste” (muda). Where waste is identified along the production process, there is always a potential for improvement. Figure 1 below highlights 8 sources of waste in Lean thinking:



The Department of data collection and methods identified several sources of waste and non-value creating activities, according to Lean thinking. Some examples were manual, paper-based and non-standardized work processes which led to cumbersome movements, stocks and waiting. The Division for Statistical populations addressed this problem by introducing electronic work flow for work concerning the updating of the business register. Each co-worker got an additional screen, and the routines were adjusted and shared to ease the work flow and reduce vulnerability. They also started measuring their work in a more systematic manner. These changes have led to improvement in several ways. The unit is now able to register and solve more cases per hour, and the stock of in-coming cases has been substantially reduced from 23 to 16 minutes per case.

The Division for Data collection coordination focused on the high frequency of corrections due to incorrect or missing specifications in the data collection preparation phase. Wrong or incomplete specification of sample frames and incomplete specifications of contents in questionnaires can lead to major quality problems and must be corrected as soon as possible by repeating and completing the process of specification. However, necessary corrections by repeating a work routine are resource consuming, especially if the same mistakes are repeated again and again. Moreover, repeated processes due to errors, lead to another source of waste in terms of waiting. Hence, the Division for Data collection coordination has started a systematic mapping of the mistakes done in the data collection preparation phase, with a description of what has happened, and the effect the actual mistake caused. By analysing the mistakes done and highlighting the root of the problem, the department intends to change

their routines in order to avoid repeated mistakes. This is a way to make active use of the PDCA cycle.

The Division for Interviews (the interview organisation in Statistics Norway) experienced that they used a lot of resources in tracking respondents. In Lean thinking they faced the situation of “overproduction” – that a lot of resources were burned, without obtaining the intended result. Tracking respondents is a vital activity in order to reduce non-response in social sample surveys. The division managed through the Lean project to implement measurements of the tracking process as a factual source to evaluate if the work done was of significance in reducing non-response. The first actions to improve the results of tracking were updating the guidelines and training the staff. Furthermore, the division is now implementing a system of automatic tracking of respondents, which partly replaces individual, manual and non-systematic approaches (Lagerstrøm, 2014).

Another example of “waste” identified in the Lean project was resources and creativity not fully used. The service of telephone support to respondents has learned that movement from cell offices to team rooms has brought people and competence together with several positive effects; more telephones are answered (response rate raised from 81 to 87 %) and respondents get quicker and more efficient support and the non-productive share of available time sunk from 9,5% to 5,5%.

Statistics Norway has not yet terminated paper based data collection. Hence, there are still issues regarding transportation of paper, both in work processes within the Department of data collection and methods and in transverse processes. The Department of data collection and methods are now preparing the shift to full electronic communication with respondents. Still, up to 1 million pieces of paper (letters and questionnaires) are sent out to respondents each year. A shift to full electronic communication will yield a substantial cost reduction.

Since the Department of data collection and methods is composed of divisions in the formal organization, but process oriented in their work, a lot of effort has been put in deliverance from one activity to another and smoother cooperation to increase the work flow. Formal meetings, plans, specifications and check lists are stressed. (In Statistics Norway we have seen that check lists give fast results, but must be followed up and improved continuously – as

the PDCA-cycle shows) The department also works to improve competence in areas/processes identified as bottle necks.

5 The way forward

After the review in the Department of data collection and methods, implementation of Lean in the rest of Statistics Norway follows the same path, based on reviews in each department with external consultants and internal facilitators. The effort invested in involving, preparing and training management and middle management is increased and Statistics Norway will educate more internal facilitators. This process is now led by an internal project manager on full time, the project manager reports directly to the Director General. By summer 2015 all departments will have been reviewed. Then our plan is to set up a new project to include transverse processes. During these projects we aim to prepare the organization to conduct continuous improvements. To achieve this, we must build up an internal support team of “Lean-experts”.

6 Lessons learned

Critical success factors for implementing Lean thinking and continuous improvement are commitment and engagement in the management, communication, training, good interaction between different units in the organization, involving the staff, implementing improved processes and measuring the effects of actions. One crucial point is that the management demands results for the chosen actions. It is also critical that we have enough internal experts to help the organization in this transformation process as well as afterwards.

In Statistics Norway, the best approach is to implement Lean in each department rather than start with transverse processes.

Challenges are:

- Top management in front, keep the Lean-thinking culture alive
- Engaging middle management
- Choosing the right process to review – balance different criteria
- Spending enough time on describing the deliverance and value for the customer
- Spending enough time on mapping the process
- Analyzing the root of problems

- Finding the right way to measure the process, and continue to measure after the first review.
- Establishing operation management – new standardized routines
- Implementing improved routines is hard work, even when the staff has ownership to the improvement
- Planning for implementing actions and follow up
- Transferring new standard procedures to other processes and commit the rest of the staff
- Remembering that the work is not finished after the first review, that's when the continuous improvement starts

References

Sayer, N and Williams, W. (2007) Lean for Dummies, Wiley Publishing, Inc.